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BRITISH MEDICAL JOURNAL

LONDON SATURDAY FEBRUARY 1 1941

ANTISEPTIC SNUFFS

BY

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Much time and thought have been given in recent years to studying the ways in which harmful bacteria and viruses pass from one person to another, and to devising methods by which such passage can be prevented. We have come to realize more clearly than we did the multiplicity of the avenues involved, and we have found some methods which should at least tend to decrease the traffic along them. Reference to recent papers by Andrewes (1940), van den Ende and others (1940), and Miles and others (1940) will show the magnitude of the problem and illustrate the methods by which it is being attacked. In addition to the primary essentials of good ventilation, the avoidance of overcrowding, and the adequate spacing of beds in sleeping quarters and in hospital wards, they include such measures as the use of aerosols or ultra-violet light to kill bacteria in the air, the use of spindle oil to prevent those that fall to the floor from rising again as dust, the avoidance of infected fluff from blankets, and the use of masks, worn either to protect other people from the wearer or the wearer from his environment, including other people. In attempts to prevent cross-infection among the wounded the whole range of surgical technique in the wards has been reviewed, and suggestions have been made for its improvement.

There is one conclusion to which, we think, all workers in this field will subscribe. There is no sovereign remedy. If the problem is solved it will be by strengthening all possible defences, not by developing some and neglecting others; though we may be able to allot priorities when we know more than we do now about the relative importance of the various channels of infection.

Some six months ago we started to approach one aspect of the problem from another angle. Of the many methods so far practised or advocated, most are aimed at reducing the concentration of bacteria or viruses in the air. The mask is the only measure at present in common use for preventing the passage of micro-organisms from or to the nose and mouth of its wearer. The mask will certainly be retained as an integral part of any aseptic hospital technique, and it may be possible to encourage its use as a method of personal protection in the presence of unusual risks; but for this purpose it is an inconvenient instrument, unlikely to be worn continuously or by a large proportion of all those exposed to infection or those capable of infecting others. If it were possible to replace it by some method of personal antisepsis something might be gained. It is this possibility that we have tried to explore.

If it is to be applicable on a wide scale and in a variety of circumstances any method chosen must fulfil the following conditions: (1) it must be easy to apply personally; (2) its application must not itself involve any risk of cross-infection; (3) it must maintain an adequate concentration of the antiseptic material in the right situation over prolonged periods of time; (4) it must be non-toxic, even when used continuously for weeks or months.

Among the methods that have often been advocated for personal prophylaxis is the use of antiseptic gargles. As a recent instance Young and Charteris (1940) state that they have obtained favourable results by the use twice daily of an acriflavine gargle in throat-and-nose wards.

A gargle is easy to apply personally under hospital or home conditions, and given a suitable antiseptic it is non-toxic. Unless a separate glass or vessel is supplied for each gargler, and care is taken that there is no sharing, the method is by no means free from the risk of itself providing an avenue of cross-infection. It produces its result mainly in the mouth and tonsillar region, and to a much less extent in the nasopharynx. It is doubtful whether, even in these situations, an adequate concentration of antiseptic can be maintained for very long after gargling. To maintain a bactericidal or bacteriostatic concentration throughout the twenty-four hours it might well be necessary to gargle a dozen times or more. The method will have no effect on the nose. For these reasons it did not seem to be a promising method of approach.

An antiseptic snuff seemed to offer better hopes of success. It is extremely easy to apply personally. Distributed in a separate container to each person it involves no risk of cross-infection in its application. Being in the form of a powder it adheres to the mucous membrane of the nasal cavities, and to some extent to the nasopharynx. In each person it will follow the course of the inspired air currents. There is, it may be noted, an extensive literature on the direction of these currents, which is summarized by Lucas and Douglas (1934). If the snuff is, at least in part, in the form of particles of the same order of size as a bacterium it is probable that the distribution of inspired bacteria and inspired snuff will be approximately the same. Being in the form of a powder the antiseptic will probably be dissolved slowly in the nasal mucus; and it should be possible to maintain an adequate concentration of any selected antiseptic for a period of days or weeks by relatively few daily applications. We decided, therefore, to study the effects of antiseptic snuffs.

Methods Employed

The main object that we had in view was to find some antiseptic snuff that would prevent the successful lodgment and multiplication of bacteria entering with the inspired air; but it seemed improbable that we should learn much from experiments with purposely inspired bacteria, since recognizable non-pathogens would not survive long in any case. We decided, therefore, to study the effect of our antiseptic snuffs on the existing flora of the nose and throat. It seemed probable that if these reagents proved capable of eliminating, or of greatly reducing in number, one or more of the potentially pathogenic species that are often present in the nose or throat they would suffice to hold in check fresh entrants of the same species.

Preliminary experiments with nasopharyngeal washings and with swabs taken and plated in the customary way convinced us that neither of these methods offered any hope of obtaining quantitative findings of the kind that we required. It also became clear that we should have to elaborate our method, taking separate samples from each nasal cavity, from each tonsil, and from the nasopharynx, in each subject under test. The technique finally adopted was as follows.

All subjects under test were examined three times a week on consecutive days. Using a head-mirror and a nasal speculum, separate swabs were obtained from the left and right nasal cavities, care being taken to sample the anterior end of the middle turbinate whenever possible, and the anterior portion of the middle meatus. Using a tongue depressor, three more swabs were taken, one from the left tonsil, one from the right tonsil, and one from the nasopharynx. The swabs used were as nearly as possible of the same size and were mounted on wooden handles.

As soon as it was taken each swab was emulsified in 2 c.cm. of nutrient broth contained in a 5-c.cm. screw-capped bottle. The swab was rotated twenty times and then pressed against the side of the bottle; and this procedure was repeated three times. The swabs were then discarded After allowing any obvious particles to settle, the fluid was drawn up in a sterile dropping pipette (50 drops to 1 c.cm.), and 30 drops were allowed to fall in the centre of a sterile 4-inch Petri dish. A sterile 7-cm. No. 1 Whatman filter paper was then lowered on to the Petri dish with sterile forceps, when, as had been found in preliminary experiments, it quickly took up the 0.6 c.cm. of fluid without leaving more than a general dampness on the bottom of the dish. The filter paper was then lowered with sterile forceps on to the surface of a blood-agar plate. As soon as contact had been made it was removed and discarded.

The plates were incubated at 37° C. for forty-eight hours and a preliminary examination made after twenty-four hours. After the full period of incubation they were placed in a blackened box, illuminated with strip lights, and photographed with a Leica camera giving a reduction of approximately 1:4.

At the twenty-four-hour and forty-eight-hour examinations of the plates the colonies were inspected, and films were made to determine the morphology of the bacteria present. In the case of staphylococci, in addition to examining for pigment formation, coagulase tests were done on colonies from many plates, but not from all. So far as other organisms were concerned no attempt was made to carry identification further than colony form and microscopical examination, except that doubtful colonies of pneumococci were tested for bile-solubility and the few haemolytic streptococci for the production of soluble haemolysin.

Although this method gave us better quantitative results than any other that we tried it will be clear that the sampling has remained inadequate, and that large variations must be expected apart from any treatment.

Fig. 1 shows the plates obtained from the right nasal cavity, nasopharynx, right tonsil, and left tonsil of a person not carrying any considerable number of bacteria in the nose. These five plates give a fair average picture of the results obtained with those persons who are not nasal carriers. The tonsils almost always give heavy growths, the nasopharynx less heavy, while the nasal cavities yield few colonies or none.

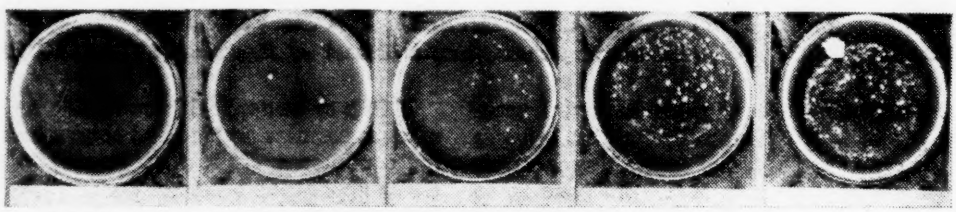

FIG. 1.—Normal Subject. Left to right, blood-agar plates from right nasal cavity, left nasal cavity, nasopharynx, right tonsil, left tonsil. No treatment.

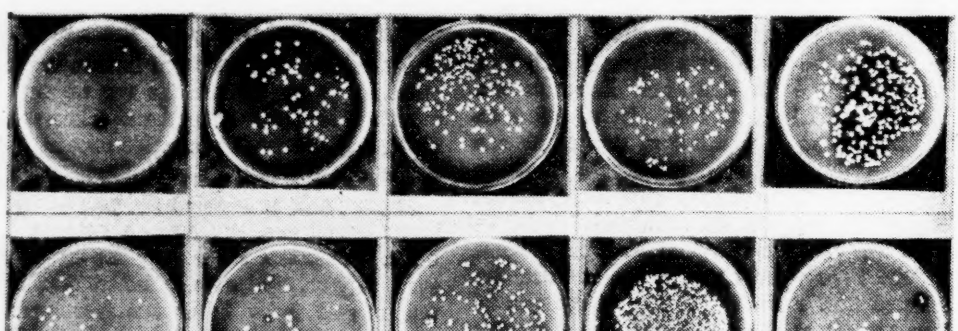

FIG. 2.—*Rows 1 and 2.* Subject C. Five successive blood-agar plates from right nasal cavity (Row 1) and from left nasal cavity (Row 2). No treatment.

Fig. 2 shows the results of five successive nasal swabbings in a subject (C) carrying staphylococci. The plates in the first row are from the right nasal cavity, those in the second row from the left. They show the kind of variation that can be expected as the result of differences in sampling, apart from any treatment.

The Antiseptic Snuffs Tested

In preliminary experiments, and before our technique of sampling had been fully developed, we tested a variety of materials, including ordinary tobacco snuffs, and lycopodium snuffs containing sodium sulphate with or without menthol, to see whether the stimulation of the normal nasal secretion would have any bactericidal effect. The results were not promising, and by the time that we had arrived at the methods outlined above we were using snuffs containing proflavine, penicillin, or sulphathiazole, with lycopodium powder or magnesium carbonate as a base. Sulphathiazole was selected in preference to other sulphanilamide compounds because of its greater action on staphylococci. Some snuffs had menthol added, some had not. The only snuffs that need be considered further are the following.

Proflavine Snuff:
5 parts by weight proflavine
5 „ „ „ menthol
90 „ „ „ lycopodium

Penicillin Snuff:
1 part by weight penicillin
5 parts „ „ menthol
94 „ „ „ lycopodium

Sulphathiazole Snuffs:
10 parts by weight sulphathiazole
5 „ „ „ menthol
85 „ „ „ lycopodium

10 parts by weight sulphathiazole
1 part „ „ menthol
89 parts „ „ magnesium carbonate

10 parts by weight sulphathiazole
90 „ „ „ magnesium carbonate

In the case of sulphathiazole we purposely started with minimal doses, to see whether we could obtain significant effects with amounts that would almost certainly prove non-toxic even when taken over long periods. The magnesium carbonate was substituted for the lycopodium because of the possibility that the continued inhalation of lycopodium spores might induce a hypersensitivity. For the small sample of penicillin at our disposal we are indebted to Prof. Florey. The properties of the crude substance as originally described by Fleming (1929, 1932) and by Fleming and Maclean (1930), together with the curative or protective effect of the purified product and its absence of toxicity (Chain and others, 1940), led us to hope that this might be a particularly favourable material for our purpose.

Results with Nasal Carriers of Staphylococci

In all we have examined 20 persons, the number of swabbings made from each varying between 16 and 32. None of the snuffs we have tested has had any detectable effect on the bacterial flora of the nasopharynx or tonsils. That they reach the nasopharynx can easily be demonstrated. With snuffs containing proflavine a trickle of yellow mucus can often be seen passing in a narrow stream from the posterior nares, frequently on one side only. With any lycopodium snuff the spores can easily be detected in swabs from the nasopharynx, and sometimes from the tonsillar region. It is probable, however, that the distribution is localized, and that the bactericidal substance employed reaches an effective concentration only in a few areas.

When it became clear that the only demonstrable effect of the snuffs was exerted on the nose, we examined, for nasal carriers of staphylococci, as large a number of subjects as were available. Those we discovered are included in the 20 subjects referred to above. In these carriers we swabbed the nasal cavities only, reserving complete swabbings for the six subjects who had formed our experimental material from the start of the investigation.

The results are not of a kind that can usefully be tabulated or be submitted to any statistical tests. All subjects were examined on three or more occasions before any treatment was begun. Some were given one variety of snuff only. Others who failed to respond to one snuff, or whose nasal staphylococci returned after temporarily disappearing or lessening in number, were subsequently treated with snuff of another kind. All that can usefully be done is to give some illustrative examples.

Penicillin

Four subjects in all were treated with penicillin snuff—this small number being due to the small supply of penicillin available. One subject was treated with penicillin alone. In three subjects a short treatment with penicillin was followed by further treatments with proflavine and with sulphathiazole. In all these four subjects the penicillin was effective in greatly decreasing the number of staphylococci, though one subject was carrying only small numbers before the treatment started. In the three subjects that were treated for short periods (seven to ten days) the staphylococci returned after the treatment was discontinued. Chart I shows the successive staphylococcal counts in the left and right nasal cavities of the subject (B) treated with penicillin snuff alone. Chart II shows the fall of the staphylococcal counts in a subject (T) treated for a short period with penicillin, and the subsequent rise a few days after the penicillin was discontinued.

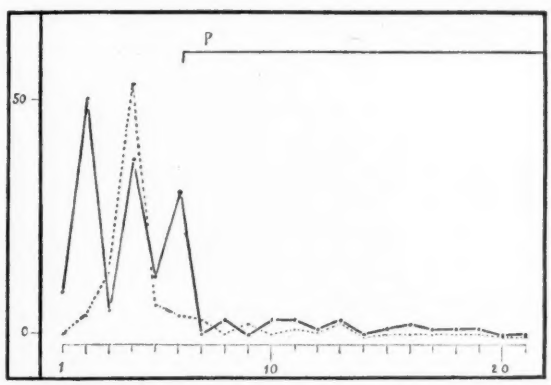

CHART I.—Subject B. Period of treatment with penicillin snuff. (For other details see text.)

In all charts the counts from the left nasal cavity are represented by a continuous line, those from the right nasal cavity by a dotted line. The figures marked along the base line represent successive swabbings, not successive days. In most subjects the routine of swabbing was uninterrupted, so that the interval between any swabbing and the third following it represents seven days.

In these and other counts the ordinates represent the number of staphylococcal colonies counted on the blood-agar plates after forty-eight hours' incubation. Counts of over 100 were recorded as > 100, and are marked as 100 on the charts. Both orange and white colonies are included. The proportions of these colonies often varied widely from one swabbing to another in the same person, and coagulase tests gave positive results with many colonies that showed no trace of orange pigment. Since it was impossible to submit every colony from every plate to a coagulase test the only practicable method was to include them all. We do not think that this has involved any considerable error in the earlier parts of the records or charts. All the subjects selected for these tests were relatively heavy nasal carriers; and it seems

to be uncommon to isolate large numbers of non-pyogenic white staphylococci from the nasal cavities. It is probable that the recording of all staphylococcal colonies has tended to some under-estimation of the reduction following the use of the antiseptic snuffs. In most cases the small numbers of colonies isolated during the later stages of treatment have been of the white variety; but in others a few typical golden colonies have been isolated after an antiseptic snuff has been taken for several days or weeks.

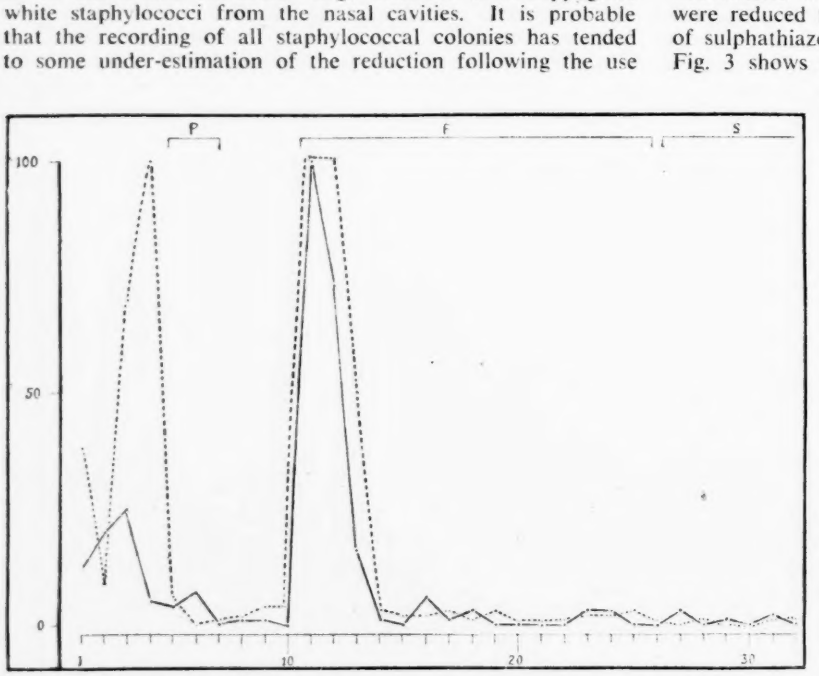

CHART II.—Subject T. P=Period of treatment with penicillin snuff. F=Period of treatment with proflavine snuff. S=Period of treatment with sulphathiazole snuff.

Proflavine Snuff

Nine subjects were treated with proflavine snuff. All of these received other types of snuff either before or after treatment with proflavine. In almost every case there was evidence that the proflavine had an effect on the staphylococcal count, and in some instances the reduction was great; but in some subjects the count, though diminished on the average, showed wide fluctuations. In Chart II it will be noted that Subject T showed a sharp rise in both nasal cavities soon after he began to take proflavine snuff, though previous treatment with penicillin snuff had been followed by a reduction in staphylococci almost to zero. Chart III shows the changes produced by proflavine in a heavy carrier of staphylococci (Subject S). It will be noted that, after wide fluctuations while taking proflavine snuff, the staphylococci were reduced to continuously low figures under the influence of sulphathiazole, the plates on many occasions being sterile. Fig. 3 shows six of the plates obtained from the right and left nasal cavities of Subject S, the first two before any treatment was given, the next two while taking proflavine, and the last two while taking sulphathiazole.

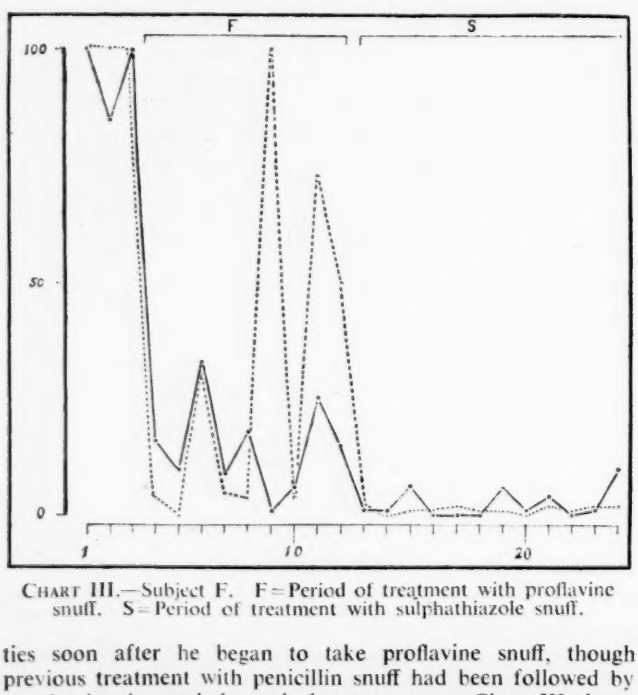

CHART III.—Subject F. F=Period of treatment with proflavine snuff. S=Period of treatment with sulphathiazole snuff.

Sulphathiazole Snuff

Nineteen subjects were treated with sulphathiazole snuff. Ten of these were treated with sulphathiazole alone. The other nine had previously been treated with proflavine or with proflavine and penicillin. The results in general were very promising. Several subjects showed a great reduction in staphylococci; in some these almost disappeared. Two cases have so far proved relatively resistant, though in one of these there was a reduction in one nasal cavity after three days on sulphathiazole and in the other after seventeen days. Chart IV shows the reduction in staphylococci in Subject W under treatment with sulphathiazole, and Chart III shows, in Subject S, the effect of sulphathiazole following proflavine. Fig. 4 shows six of the plates obtained from Subject W, the first three before taking sulphathiazole, the second three afterwards. The plates in the first row were obtained from the right nasal cavity, those in the second row from the left.

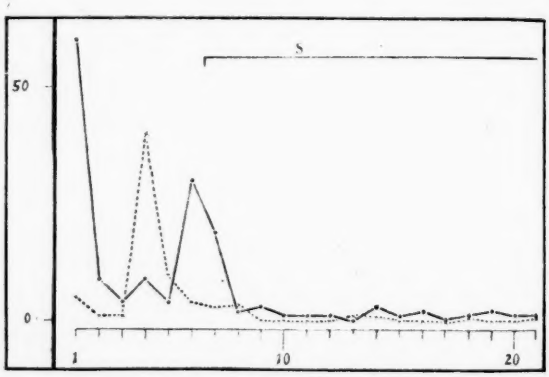

CHART IV.—Subject W. S=Period of treatment with sulphathiazole snuff.

Control Snuff

During an early stage of the investigation three subjects were treated with a control snuff containing only menthol (5%) and lycopodium. None showed any significant change in the nasal flora.

Results with Other Organisms

Staphylococci were not, of course, the only organisms cultivated from the nasal cavities of these 20 persons. In regard to other bacteria a few points are worth noting. Several subjects carried a diphtheroid bacillus which had the morphological appearance of Hoffmann's bacillus but was not further identified. The action of sulphathiazole snuff on this was dramatic. The organism in most cases entirely disappeared shortly after treatment was started. It is quite possible that both penicillin and proflavine would have produced a similar result had similar cases been treated with these snuffs.

A Gram-negative coccus of the *N. pharyngis* type was present in a few subjects. This proved much more resistant than staphylococci both to penicillin and to sulphathiazole. We had no opportunity of testing its resistance to proflavine.

The findings in regard to pneumococci were curious. Not many subjects were nasal carriers of this organism, but in a few cases it appeared while a subject was taking

sulphathiazole snuff, and in some others this snuff failed to rid the nasal cavities of pneumococci that were already present. We have had no opportunity of estimating the effect of penicillin or proflavine on nasal carriers of this organism.

Antiseptic Snuffs in Relation to Colds

There is no evidence that any one of the three antibacterial substances tested has any action on filterable viruses. They would not therefore be expected to have any effect in preventing the acute infectious cold, and no such effect was in evidence. Several subjects developed colds, in most cases very mild, while taking one or other of the snuffs. There was, however, a suggestion that the sulphathiazole, and perhaps the proflavine, had an effect in modifying the course of a cold. One subject with a long history of characteristic colds in previous winters developed a cold that lasted for several weeks, with a relatively copious mucous discharge. Contrary to the experience of earlier years the mucous discharge remained clear throughout, plates from the nasal cavities remained almost sterile, and there were none of the symptoms usually associated with the later stages of a cold when the discharge has become purulent. Another subject, whose nasal cavities were not being swabbed, had a similar experience. A third person, also not included in the bacteriological survey, started to take sulphathiazole snuff on the second day of an acute cold. This cold cleared rapidly, and without the muco-purulent discharge to which the person in question was accustomed. We have had no opportunity of studying the effect of penicillin snuff in similar circumstances.

Discussion

The cases examined in this investigation are far too few to justify any definite conclusion. In normal times we should have hoped to study many more cases before publishing our findings. But the times are not normal, and we are therefore putting these findings on record in the hope that others may be able to test the significance of the results we have obtained, which at the moment are clearly no more than suggestive.

Of the three snuffs we have tried we should not ourselves regard it as worth while to proceed further with proflavine. It has proved less effective than either penicillin or sulphathiazole, and its bright yellow colour is singularly unattractive on the nostrils, the upper lip, or the handkerchief. It seems quite probable that penicillin will prove particularly effective as an antiseptic snuff. We hope later to have an opportunity of putting it to a more adequate test, alone or in combination with sulphathiazole. At the moment we think that the snuff most worth testing is the simple mixture of sulphathiazole and magnesium carbonate, though we suspect that the percentage of sulphathiazole might be increased with advantage. As regards administration, it seems better to avoid using the fingers and so possibly contaminating the snuff in a box. We have dispensed the snuff in small cardboard pill-boxes holding about 1 gramme. An easy method of taking the snuff is to cut or tear a small triangle of paper, and to load one corner with a large pinch of snuff for each nostril. In recent trials we have, quite arbitrarily, instructed the subjects under test to take the snuff six times a day. Used at this rate 1 gramme lasts for three to four

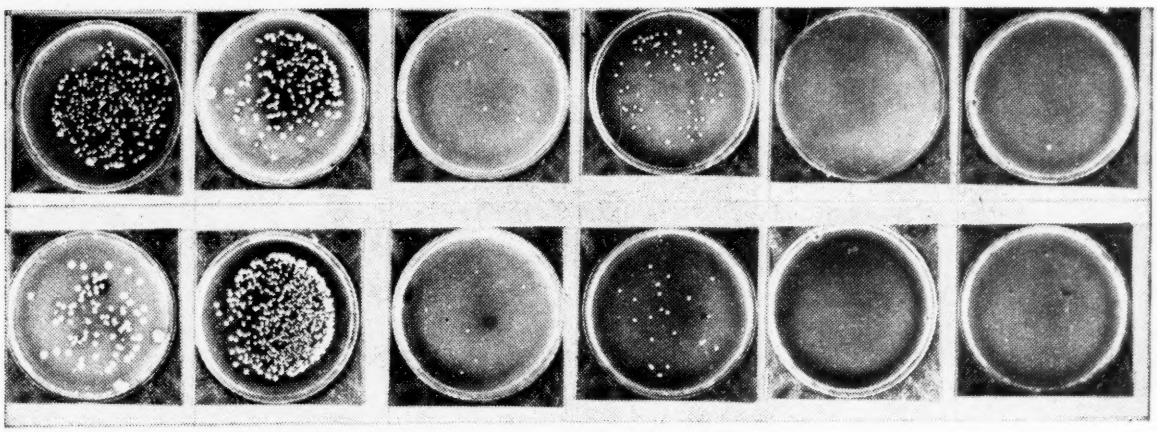

FIG. 3.—*Rows 1 and 2.* Subject S. Six blood-agar plates from right nasal cavity (Row 1) and from left nasal cavity (Row 2). 1 and 2 before taking snuff, 3 and 4 while taking proflavine snuff, 5 and 6 while taking sulphathiazole snuff.

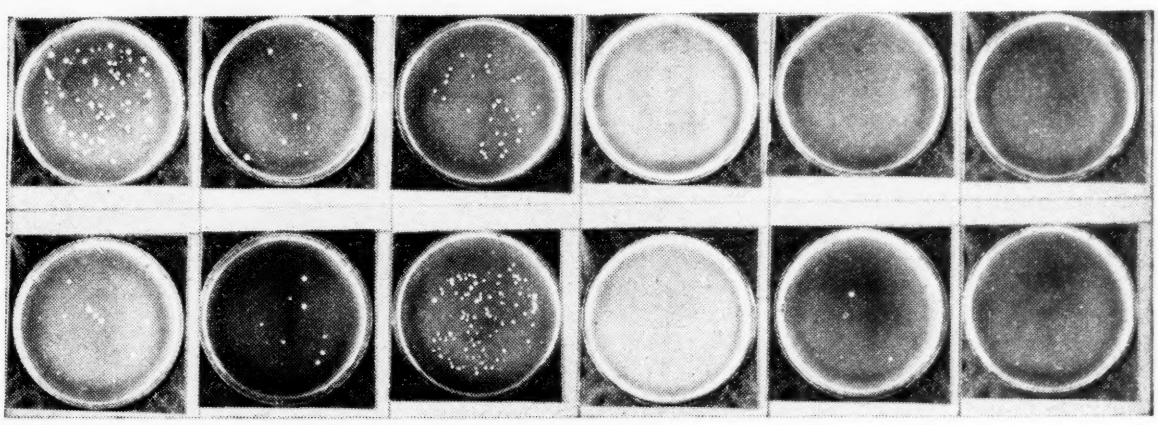

FIG. 4.—*Rows 1 and 2.* Subject W. Six blood-agar plates from right nasal cavity (Row 1) and from left nasal cavity (Row 2): 1 to 3 before taking snuff, 4 to 6 while taking sulphathiazole snuff.

days. This involves the taking of approximately 0.03 gramme of sulphathiazole a day. It is very doubtful whether even this small amount is absorbed. Certainly much of the snuff remains in the nasal mucus, and thence escapes on to the handkerchief. It seems very unlikely that any toxic symptoms would develop from doses of this order, however long they were continued. In view of the apparent failure of sulphathiazole, in the doses employed, to act effectively on pneumococci, against which the drug is known to be active, we think that larger or more frequent doses of snuff, or a higher concentration of the drug, might well be used in future tests.

How far the snuff will be useful as a prophylactic it is impossible to say. It seems reasonable to suppose that, in so far as it can diminish the number of existing pathogens in the nasal cavities, it should help to prevent the multiplication of fresh entrants of the same species in the same situations. As has been noted, an antiseptic snuff has no demonstrable effect on the pre-existing flora of the nasopharynx. It does not follow that it will not reduce the frequency of successful colonization by new entrants through the nasal passages. Some of them may be caught and destroyed on their way through the nose. Moreover, as has been noted above, the snuff certainly gains access to the nasopharynx, and some of it adheres to the mucosa and must therefore lead to a local concentration of the antiseptic. Since inspired bacteria will probably lodge in the same situations, the snuff may be more effective in dealing with these than with the more widely dispersed normal flora. On bacteria breathed in through the mouth it will presumably have little if any effect.

So far as the cure of nasal carriers is concerned, it will be noted that we have not yet succeeded in freeing the nose completely from staphylococci, and have no data as to what happens after the taking of sulphathiazole snuff is stopped. It seems very probable that treatment would have to be continued for a long time to effect any permanent cure, and that, in cases in which organisms are vegetating in deep crypts or in any of the nasal sinuses, an antiseptic snuff would do no more than hold in check the surface colonization.

There is one general criticism that might be made of all our findings with proflavine and penicillin snuffs. It might be argued that the low counts obtained during the period of treatment were due not to any diminution of staphylococci in the nasal cavities but to a reduced growth on our plates resulting from the carrying over of sufficient proflavine or penicillin to produce an inhibitory effect. We do not think that this possibility can be ignored. Swabs were never taken less than two hours after the last administration of snuff, but the active substance may dissolve and diffuse slowly in the nasal mucus. The concentration of the antiseptic in the broth suspension probably varied widely as the result of sampling differences, and may sometimes have been sufficient to inhibit growth. We have no records of swabbings taken several days after proflavine snuff had been discontinued and no other snuff substituted; but Subject T remained almost free from staphylococci for eight days after a short course of penicillin snuff, and it seems very unlikely that an inhibitory concentration could have been present at this period.

The same criticism does not apply to the results obtained with sulphathiazole, since this substance has no inhibitory effect on the growth of staphylococci on plate cultures.

With these reservations we think that the following suggestions are in conformity with the very scanty evidence.

1. An antiseptic snuff containing sulphathiazole or penicillin may lessen the frequency of effective invasion of the nose by bacteria or the invasion of the nasopharynx through the nose. It may therefore prove of use as a prophylactic against bacterial infections of the upper respiratory tract and perhaps against cerebrospinal meningitis, though on the latter point we have no direct evidence apart from the known activity of the sulphanilamide compounds against the meningococcus. The most that can be said at the moment is that the method seems worthy of trial.

2. There is no evidence that it will prevent or cure the common infectious cold. It may favourably affect the course of a cold by preventing secondary bacterial infection.

3. It may perhaps prove effective in curing nasal carriers of staphylococci or in reducing the number of vegetative organisms, so that the carrier becomes less dangerous as a source of infection to others.

4. In view of its action on diphtheroids it seems desirable to test its possible usefulness in the treatment of nasal carriers of diphtheria bacilli.

5. How far it will affect other pathogenic organisms in the nose there is as yet no evidence.

Since none of the antiseptic snuffs we have tested has had any effect on the nasopharyngeal or tonsillar flora we have attempted to influence these flora by the use of tablets containing proflavine or sulphathiazole. These tablets have been gently sucked in the hope of inducing an effective concentration in the throat. Neither has given any demonstrable results, and the aesthetic effects of proflavine tablets have been even less attractive than those of proflavine snuff. We are now investigating the possibility of influencing the nasopharyngeal and tonsillar bacterial flora by the oral insufflation of antiseptic powders; but these trials are as yet in their earliest stages.

Finally we wish to express our thanks to all those who have co-operated with us by taking our snuffs and by submitting to repeated swabbings over many weeks or months.

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Malaria in Bengal.—In his report for 1938 Lieut.-Colonel A. C. Chatterji, Director of Public Health, Bengal, states that malaria took away 416,521 lives with a death rate of 8.3 per mille in the year under review, against 372,992 with a death rate of 7.5 per mille in 1937—an increase of 10.6% in the death rate. Malaria accounted for 50.8% of the total fever mortality and for 31.0% of the total provincial mortality. The statistics provide clear and telling evidence of what the future of Bengal villages will be unless adequate measures are devised without loss of time. Malaria is the most important and direct cause of physical unfitness and extensive economic ravages of the population. In Bengal 93% of the people live in villages, but the proportion of malaria between the rural and the urban areas is 99.3 and 0.7 respectively. Altogether 4,273,307 cases of malaria were treated in 1938 in the various hospitals and dispensaries in Bengal, but this number is only a small fraction of the annual malaria incidence in rural and urban areas. It has been estimated that the total incidence is somewhere between 30 and 40 million cases out of a population of 51 millions in this Province of India. Bengal could easily consume 350,000 lb. of quinine every year in the treatment of malaria, but during 1937–8 the amount used was only 112,353 lb. The comprehensive malaria survey of representative areas in different parts of the Province was continued uninterruptedly during the year. The mosquitos collected from the villages surveyed were identified locally by trained assistant epidemiologists in charge of survey parties, and were also sent to the Bengal Malaria Research Laboratory, Calcutta, for checking and confirmation.

DIARRHOEAL DISEASES IN GLASGOW

BY

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Interest in diarrhoeal disease was intensified following the appointment of a subcommittee on enteritis in infancy by the Preventive Medicine Committee of the Medical Research Council. I am indebted to Dr. A. S. M. Macgregor, a member of the committee, for the suggestion to compile this review of the prevalence of the diarrhoeal diseases in Glasgow, with special reference to non-specific enteritis. The incidence of these diseases is indicated in the following list, which shows the average number of deaths or cases registered annually:

Diarrhoea and enteritis (all ages), 1919–38	422 deaths
Bacillary dysenteries, 1919–38	90 cases
Typhoid, 1925–38	41 ,,
Paratyphoid, 1925–38	63 ,,

The specific infections in the above order have shown an average primary fatality of 5, 15, and 5% respectively. As regards the fatality of non-specific diarrhoea, Cooper (1937), studying 300 cases of acute (mild and severe) and chronic gastro-enteritis in a Glasgow children's hospital, recorded a case mortality of 47%. A measure of the morbidity from non-specific enteritis is thus provided, because on an annual average 70% of the deaths from enteritis in patients under 2 years of age occur in hospital.

Age and Sex Distribution

The average age distribution in the non-specific group has been as follows:

	−1	−5	5+	Total
Deaths	298	60	64	422
Percentage	71	14	15	100

Infants are therefore mainly involved. In the specific groups infections of infants are few. Of 908 dysentery patients registered during the past four years, 412 (45%) were under 15 years of age, but only thirty (3.3%) were under 1 year. Similarly, only 2% of paratyphoid and less than 1% of typhoid patients are under 1 year old.

The distribution of the sexes also varies in the different groups. For dysentery it is approximately equal. Among enteric cases, especially paratyphoid, females exceed males —a reversal of sex incidence in years preceding 1914 that has been chiefly attributed to extensive wartime inoculation of males. Infantile digestive diseases, on the other hand, kill 140 males for every 100 females. However, the proportion of infantile mortality in each sex due to digestive disease is approximately the same for males and females—namely, 14 to 15%.

Annual Incidence

The "residual" numbers of the specific infections are occasionally multiplied through agencies which may or may not be recognized. Thus in 1935 forty-one pilgrims imported typhoid; in 1936 paratyphoid notifications numbered 195; and during the period 1935–8 the annual dysentery notifications averaged 227, of which 101 were notifications of infections contracted annually in institutions. Deaths from non-specific diarrhoea show relatively smaller fluctuations. During the past twenty years these have ranged between 279 and 536, excepting 1921, when they numbered 702.

The annual fluctuations in the several diarrhoeal diseases seem mutually unrelated. Between 1919 and 1938 there was increased annual prevalence of one or more of these diseases on thirteen occasions. In eight of these years one or another of the diseases was increased alone; on the remaining five occasions varied associations between the diseases were recorded.

The average of 422 deaths, constituting a death rate of 0.374 per 1,000 living, represents a definite but disappointingly moderate improvement on the rates of 0.843 for the period 1891–1900 and 0.681 for the period 1901–10. Indeed, as long ago as 1909 and 1910 the corresponding rates were 0.130 and 0.161 respectively. On the other hand, the enteric death rate, which was 0.215 in 1891–1900, has now fallen to the low level of 0.010. As annual causes of infantile mortality, digestive diseases continue to be exceeded only by immaturity and respiratory diseases; infrequently infectious disease rises from fourth to third place.

Seasonal Incidence

The following table shows the seasonal incidence of deaths under 1 year from diarrhoea and of their quarterly peak during the decennium 1928–37:

	Quarter				Total
	1st	2nd	3rd	4th	
Deaths	573	603	915	941	3,032
Quarterly peak			7	3	10

Enteric infections, especially typhoid, and non-institutional dysentery also tend to reach a peak in the third quarter, the warmest of the four quarters; but the non-specific group alone reveals the regular occurrence in another quarter of an alternative seasonal peak. Cooper recorded that half his patients had been ill for only a week or less. The high incidence of non-specific diarrhoea in the fourth quarter is therefore not altogether due to the termination in that quarter of illnesses previously contracted.

Graham (in 1936) held that the incidence of infantile mortality from diarrhoea now tended to show a winter instead of a summer peak owing to respiratory infections. The researches of otologists in other parts of the country into the association between otitis and gastro-enteritis lend support to this view, as also to their injunction to mothers to shield their infants from adults suffering from colds or influenza. In Glasgow, too, as described below, an institutional outbreak of presumably virus origin, which caused 7 neonatal deaths among 9 cases during the early part of 1938, was marked by rhinitis at onset, although the terminal phases consisted of enteritis. Nevertheless the seasonal behaviour of the non-specific group can still be described as generally "diarrhoeal" rather than "respiratory" in character. As indicated by the monthly mean shade temperatures, the warmest month of the year is usually July, less frequently August, and deaths from infantile diarrhoea continue to reach their monthly peak, as they did in years preceding 1914, during August or, somewhat less often, in September. Moreover, Macgregor (1933) has pointed out that while bronchopneumonia has an irregular seasonal incidence lobar pneumonia regularly maintains high prevalence during the first four months of the year. As shown above, infantile mortality from diarrhoea is relatively low during the early months of the year. Similarly, Stirk Adams (1937) reported that paracentesis operations for otitis media in a children's out-patient department in Birmingham showed a winter crest and a September trough; whereas, as we have seen, September is a month of high incidence of gastro-enteritis.

Housing Accommodation and Fatal Enteritis

As enteritis is not a notifiable disease epidemiological information regarding cases is generally meagre. During the years 1926–32, however, information regarding size

of house and number of inmates was noted in connexion with the registration of 2,163 deaths from diarrhoea in children under 2 years of age. The opportunity has been taken to compare the housing accommodation of these children with the size of house noted in connexion with a series of births:

	Apartments				Total
	1	2	3	4+	
Births	12	37	29	22	100%
Diarrhoeal deaths under 2 years ..	36	52	10	2	100%

A disproportionate incidence of diarrhoea among the children in the smaller houses is apparent. This analysis also revealed, incidentally, that the housing distribution of births was very similar to the size distribution of all Glasgow houses. In the following table, therefore, one may reasonably compare the percentage of various sizes of houses known to be overcrowded in Glasgow with the percentage of overcrowded houses among the homes of the 2,163 fatal diarrhoea cases:

	Apartments				All Houses
	1	2	3	4+	
Percentage of houses overcrowded: Housing Act survey	52	43	18	4	31
Percentage of houses overcrowded: Diarrhoeal deaths under 2 years ..	94	80	47	23	82

A striking degree of overcrowding among the diarrhoea cases is seen when compared with overcrowding existing generally in the city.

To corroborate this finding an effort was made to ascertain the degree of overcrowding among births. Such information is available from health visitors' records regarding midwives' births—i.e., births at which there is no medical attendance. The housing conditions in a series of these births were as shown:

	Apartments				All Houses
	1	2	3	4+	
Midwives' births: size of house ..	37	47	12	4	100%
Midwives' births: percentage overcrowded	66	47	33	21	51

A close resemblance is seen between the size distribution of these poor houses and the size distribution, previously tabulated, of the houses of the fatal diarrhoea cases. It is therefore noteworthy that the overcrowding even among the poor homes of the midwives' births falls short of the overcrowding, previously tabulated, in the homes of the diarrhoea cases. The apparent effect of overcrowding is not due, as in the incidence of the infectious fevers, to the frequent occurrence of multiple cases in the same house; for such association of cases, which mainly concerned twins, was very uncommon.

Prevention of Enteritis

In discussing prevention practically all the authorities stress the importance of breast feeding. Still (1933) recorded that 96% of his fatal cases of infantile diarrhoea had occurred among artificially fed children. Graham laid emphasis on breast feeding, hygienic environment, and the maintenance of weight; and ascribed to children in Glasgow under 70% of their normal weight a diarrhoea mortality more than twice as high as among children of normal weight. Cruickshank (1937) specified as the important adverse factors artificial feeding, infancy, unhygienic surroundings, and raised internal or external temperatures. It is of interest to note that Ebbs (1937) also stressed the importance of breast feeding in his discussion of post-mortem examination of 880 children, 80% of whom had died under 2 years of age from all types of medical and surgical conditions. Of these children under 2 years old 238 had suffered from gastro-enteritic symptoms, and 193 of these had had otitis media, while purulent ear material had been found post mortem in 52% of the entire group studied. Only a negligible number of all these children had been breast-fed. On the whole it is accepted that breast feeding (or suitable and careful artificial feeding) and hygienic surroundings are important factors in the prevention of gastro-enteritis as of other infantile diseases. Apart from illness due to any pathogenic bacteria in prepared foods as sold, unsuitable food could obviously result in digestive disorder, while careless feeding could act by conveying infection. In Glasgow, as described above, enteritis deaths are associated with the two unhygienic environmental factors of small size of house and overcrowding of house, and such factors could presumably operate either by impairing vital functions or by facilitating the spread of infections.

Infective Enteritis

Thus both infection and physiological upset appear to play a part among the non-specific diarrhoeas. When cases occur acutely in groups infection is naturally suggested; in other instances digestive derangement seems sufficient explanation. A link between the two types of cases is provided by the work of Blacklock, Guthrie, and Macpherson (1937). They found a sequence of events in infantile gastro-enteritis consisting of impaired gastric secretion, interference with normal acidity, and ascent of coliform organisms to the upper part of the small bowel; and held that these events could be initiated by fever due to an infection as well as by unsuitable feeding, even on occasion by feeding with cows' milk.

Outbreaks of non-specific enteritis outside institutions have not attracted attention in Glasgow. In 1929 one such outbreak was discovered through its association with an epidemic of dysentery. The dysentery epidemic was regarded as comprising 51 persons, although positive specimens were obtained from 35 only. In the non-specific outbreak specimens were examined from 93 persons. At the same time as these two outbreaks were proceeding side by side a morbidity inquiry was being conducted in a neighbouring district, and no cases of infectious diarrhoea were discovered there.

The limited extent of the prevalence of the specific diarrhoeas among even infective cases of diarrhoea thus illustrated increases the importance of the non-specific group and of its study. In a few localities hospital arrangements have been made which diminish possible spread of infection within the institution and at the same time facilitate investigation. For these arrangements the energetic co-operation of the hospital administration is necessary.

Hospital Arrangements

Mitman (1937) and Joe (1937) described their arrangements for the segregation in special wards planned on the "cell" system of all cases of non-specific enteritis, primary or secondary to infectious disease, occurring in two L.C.C. fever hospitals. Special attention was devoted in these wards to the handling of food and to the prevention of cross-infections, whether respiratory or enteral.

The segregation of cases of non-specific enteritis admitted to or sickening in general institutions would also be a valuable procedure. Although open wards, preferably small, might have to be used in some instances, cubicles or compartments are desirable, since a variety of infections may be concerned. The possession of a training qualification in fever by the nursing staff attending

these cases would obviously be an advantage. Epidemiological, clinical, pathological, and therapeutic studies would be facilitated by special wards. Any grouping of cases could be recognized by noting the ward or address of sickening of the cases. The incidence and nature of parenteral complications could be recorded. Cooper, for example, found that 40% of his 300 cases had parenteral affections; of these 122 cases 78 had otitis media, 11 pyuria, and 9 bronchopneumonia. Routine examination of ears, such as was reported by Maizels and Smith (1934), could also be performed, and that preferably by an otologist owing to the difficulties in diagnosis and treatment of ear disease in young children. Chemical and dietetic treatment are aspects attracting investigation even in the present state of knowledge regarding the aetiology of the disease. Chemotherapeutic successes have not yet been reported; but the work of Anderson (1939) on the treatment of measles by sulphanilamide suggested that the latter might have some value in prophylaxis against secondary gastro-enteritis

Enteritis and Otitis

Reference has already been made to the association between enteritis and otitis recorded by Cooper and, to a more striking extent, by Ebbs. Blacklock, Guthrie, and Macpherson found that the purulent exudate seen post mortem in 90% of their gastro-enteritis cases sometimes contained coliform organisms which had presumably spread from vomited material in the nasopharynx. As they also commented, however, other workers continue to submit that otitis may be primary to gastro-enteritis, and, in any case, otitis media figures prominently among parenteral conditions reported to be associated with gastro-enteritis.

The practical implications of this association may cause difficulty to administrators as well as to clinicians. Maizels and Smith reported case mortalities of 31%, 80%, and 50% respectively among their small groups of enteritis cases without ear disease, enteritis cases with surgically untreated ear disease, and enteritis cases treated surgically for ear disease. Such evidence implies that for the routine treatment of infantile gastro-enteritis outdoor medical services would require to be supported by specialist services or ample hospital accommodation.

Since streptococci and pneumococci are said to account for almost two-thirds and one-third respectively of middle-ear infections, Cleminson (1939) suggested the use of sulphapyridine on the first appearance of ear symptoms or signs of otitis in school children. The routine application to infants, however, of even such a chemotherapeutic measure will present a problem in proportion to the difficulty of recognizing the indications for treatment.

A Fatal Neonatal Outbreak

Some points mentioned above are illustrated by a series of related illnesses with terminal enteritis which occurred early in 1938 among the newborn children in the maternity unit of a Glasgow municipal hospital. Although the cases were afebrile infection was obviously at work. Seven of the 9 cases sickened during the first three days of the year, and the remaining 2 within forty-eight hours of each other towards the end of February. The ages at onset were 3 to 7 days. The recurrence of what was apparently the same infection took place despite the closure of the ward to admissions from early in January till mid-February and despite the introduction, on reopening with different nursing attendants, of linen masks for use during the handling of infants. Arrangements had also been made for the sterilization of infants' towels and clothes and for the use of an infant's towel once only.

The infection was obviously respiratory, for the resident medical officers reported that the onset had been marked by rhinitis with clear or purulent discharge. They took nasal swabs from 7 cases and, in connexion with the first group of cases, nose or throat swabs from 28 contacts, including mothers, nurses, and all infant contacts. The following findings were reported:

> Cases: *Staph. aureus*, 2; *Staph. aureus* and diphtheroids, 1; *Staph. albus* and *Strep. viridans*, 1; staphylococci and coliforms, 1. Last two cases: diphtheroids, 1; staphylococci and *M. catarrhalis*, 1.
>
> 18 adult contacts: *Staph. aureus*, 4; *Staph. albus*, 2; staphylococci and streptococci, 11; haemolytic streptococcus, 1.
>
> 10 infant contacts: *Staph aureus*, 4; staphylococci with streptococci and other organisms, 6.

One of the two cases which recovered was also one of the two cases whose nasal swab had yielded *Staph. aureus* in pure culture. Blood culture was attempted in one case, with negative result. One child, born of a syphilitic mother, showed purulent ophthalmia which yielded a staphylococcus, probably *aureus*. Associated infections in the ward were as follows: One case of maternal sepsis in mid-December and another early in January, a case of maternal mastitis early in January, two cases of infantile pemphigus in the second week of December, and an attack of *Staph. aureus* mastitis in an infant a fortnight after his recovery from the outbreak infection.

The terminal phase consisted of enteritis with loose or green stools and, in two instances, the appearance of blood and mucus. Death occurred on the second to the seventh day of illness and the enteritis had appeared one to four days after the onset. Stools were reported negative for staphylococci and streptococci as well as for dysentery and enteric. Similar cases occurring sporadically under different circumstances could understandably present themselves as clinical cases of acute primary enteritis. In the early group the only clinical features reported besides rhinitis and enteritis were loss of weight and, in one case, cyanosis. The last two cases were both fatal. One of these showed oedema of the face and scalp; the other showed hard swelling of the face and scalp, ophthalmia, and attacks of cyanosis with shallow respirations.

The infective agent was not identified nor was its source recognized. Necropsies were performed, however, in 4 of the 7 fatal cases, including the last 2, by the pathologist of Stobhill Hospital, Dr. F. E. Reynolds, and the deaths were ascribed to infection by a virus. Signs of severe toxaemia or of septicaemia were found post mortem. At one necropsy the findings included acute encephalitis and lateral ventricular haemorrhages; at two others haemorrhages of considerable size in various situations, including the peritoneal cavity, were recorded. In the remaining necropsy (Case No. 8) the diagnosis of virus infection was largely based on the clinical history and the epidemic context. Abstracts from the pathologist's reports are given hereunder.

Case No. 5.—No congenital abnormalities; peritoneum covering the structures in upper part of abdomen smeared with blood; lungs deeply congested; about the middle of small intestine, over a distance of 10 cm., mucous membrane haemorrhagic with haemorrhage into lumen, and below this flakes of blood clot mixed with the mucus-like contents of bowel; haemorrhage of some size into right adrenal gland; other organs, including brain, congested. Diagnosis: acute and severe toxaemia. Microscopical examination confirmed the above data.

Case No. 6.—No congenital abnormalities; blood vessels on the surface of the brain and those within its substance engorged; considerable subdural haemorrhage; lateral ventricles filled with dark blood clot; thoracic and abdominal organs deeply congested; Peyer's patches dark red in colour; distal 20 cm. of ileum deeply engorged and a certain amount

of blood in the lumen. Diagnosis: acute encephalitis with consequent haemorrhage into subdural space and into lateral ventricles. Microscopical examination confirmed the diagnosis of acute encephalitis.

Case No. 8.—Well-developed child without congenital abnormalities. Clear dark straw-coloured fluid in pleural cavities and pericardium. Much oedema and many petechial haemorrhages in scalp over vertex and occiput. Pial vessels congested and many petechial haemorrhages in brain substance, including cerebellum. Petechial haemorrhages below visceral pleura on each side and one below visceral pericardium. Several considerable haemorrhages into substance of each kidney. Congestion of lungs, especially bases, and of liver and spleen. Diagnosis: acute septicaemia.

Case No. 9.—Small child, born after 7½ months' pregnancy of mother with a positive blood Wassermann. Considerable haemorrhage into pericardium and into peritoneum. Patches of intense pulmonary congestion into which quite massive haemorrhages had occurred. Liver and spleen almost black from congestion but of average size. Congestion of kidneys, bladder, alimentary tract, and adrenal glands. Considerable oedema of scalp. Leptomeninges and brain intensely congested and some haemorrhage into leptomeninges. Microscopical examination: Brain—vessels congested but no cellular infiltration of perivascular sheaths; occasional small haemorrhages. Liver—blood sinusoids greatly congested. Lungs—in portions examined, alveoli and small bronchi filled with blood.

Summary

The notifiable diarrhoeal diseases have occasions of increased prevalence but "residual" average dimensions. Non-specific diarrhoea results in considerable relatively constant annual mortality, mainly among infants. Specific diarrhoea cases and enteritis deaths are usually highest in the third quarter. Enteritis deaths are regularly frequent also in the fourth quarter. In a Glasgow series of enteritis deaths nearly nine-tenths of the homes were small and four-fifths were overcrowded. The aetiological significance of these seasonal and environmental factors is discussed. Reference is also made to the advantage of segregating hospital cases of non-specific gastro-enteritis and to the practical implications of the recognized frequency of association in infants between enteritis and otitis.

In a winter outbreak of neonatal infections in a Glasgow institution 7 of 9 cases ended fatally after an afebrile illness characterized by rhinitis at onset, loss of weight, and terminal enteritis. The bacteriological findings in the noses or throats of cases and infant and adult contacts are reported. Four cases went to necropsy, and infection was ascribed to an unidentified virus. Abstracts of the pathologist's reports are given.

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O. M. Stout and R. J. Kositchek (*Arch. Derm. Syph.*, 1940, **42**, 803) report their observations on fifty-eight patients in whom pruritus was an outstanding symptom and who were treated at first with subcutaneous and later intravenous injections of 50 c.cm. of a 50% solution of dextrose. They found that the injections were of value in treatment of serum sickness, of temporary but often prolonged value in certain kinds of pruritus, and useless for pruritus in dermatitis venenata, senile pruritus, and infectious eczematoid dermatitis.

THE PROPHYLAXIS OF THROAT INFECTION

BY

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At this time of the year there is always a sharp rise in the incidence of infections of the upper respiratory tract. This winter the conditions of overcrowding and poor ventilation which prevail in public air-raid shelters will undoubtedly prove to be another important factor in the aetiology of these diseases. Various remedies to solve the shelter problem, such as the use of aerosols to diminish air-borne bacteria, are being investigated, but it is unlikely that these will be in operation before the winter is far advanced. In the meantime some simple method of prophylaxis which can be easily applied to large numbers of people is urgently required.

The Case for Nasopharyngeal Hygiene

The throat and nasopharynx form a natural reservoir and breeding ground for many varieties of pathogenic organisms, their dissemination into the atmosphere taking place by means of the buccal spray. A recent Ministry of Health memorandum (Straker, Hill, and Lovell, 1939) on the bacteria of the nasopharynx has shown that the carrier rate of throat-borne infections is astonishingly high, up to 20% of throat swabs yielding cultures of *Strept. haemolyticus* and 20 to 60% yielding pneumococci. *Haemophilus influenzae* showed a constant carrier rate in the nasopharynx of 60 to 65%. It has also been proved that during most of the large influenza epidemics of recent years the causal virus could be isolated from throat garglings.

Local treatment of the throat and nasopharynx has been regarded with a great deal of reserve since the last war, due largely to the conflicting results obtained in attempts to eliminate the meningococcus carrier. But in view of the pathogens which inhabit the throat in both health and disease there must still be a place in prophylaxis and therapeutics for one method of local treatment—the antiseptic throat spray. For whereas the limit of effective action of the gargle is somewhere between the pillars of the fauces, the throat spray, which projects droplets of fluid direct into the throat, brings the antiseptic into contact with the pharyngeal mucosa.

The following investigation was carried out in a large naval training establishment during the 1939–40 epidemic of influenzal nasopharyngo-tracheitis with the object of estimating the prophylactic value of the antiseptic throat spray. A solution of sodium hypochlorite (15 to 20%) was chosen as the antiseptic because it combines a powerful bactericidal action with a strong oxidizing and deodorant quality.

Procedure

Two groups each of fifty naval ratings were selected from those joining the establishment for the first time. Care was taken to ensure that these two groups should live under identical conditions in the same part of the establishment and that they should perform similar duties. From the day of joining the establishment one of these groups was subjected to a daily prophylactic routine, this being omitted in the case of the other group. The routine adopted was as follows: Each morning at 6.45, immediately after assembly, the group chosen for treatment was subjected to a throat spray of 15 to 20% sodium hypochlorite solution. The instrument used for producing the spray was a portable pressure atomizer. This consists of a hand-pressure pump fitted with a spray nozzle and

made of chromium-finished metal. During use pressure in the body of the instrument was raised by means of the hand pump, the spray being controlled by a stopcock at the base. The spray was projected direct into the throat and the fluid accumulating from this was enough for a final gargle. It was found that the treatment could be carried out on a class of fifty ratings in six to seven minutes. This routine was continued daily until the time of their departure from the establishment some five weeks after joining. During these weeks any rating of either class who reported to the medical department with any complaint whatever was seen by me and his condition noted.

	Untreated Group	Treated Group
Number admitted to hospital	13 (26%)	6 (12%)
Complaint	Acute sore throat, 11; common cold, 2	Cerebrospinal meningitis, 1*; acute sore throat, 3; common cold, 2
Number attending for daily treatment ..	23 (46%)	12 (24%)
Complaint	Sore throat, 18; common cold, 4; suppurative otitis media, 1	Sore throat, 6; common cold, 6

* This case of cerebrospinal meningitis developed on the second day after the entry of the rating to the establishment.

By "acute sore throat" is meant acute streptococcal tonsillitis and pharyngitis, together with marked constitutional symptoms so typical of the 1939–40 epidemic. By "sore throat" is meant a subacute infection of fauces and pharynx, and "common cold" indicates acute coryza with slight constitutional symptoms but little or no throat infection.

Conclusions

The results of this investigation, which are shown in the preceding table, demonstrate clearly that during the five weeks that these two groups remained under observation the incidence of sickness occurring in the treated group was greatly diminished. The total number of patients requiring to be admitted to hospital during this period, as well as those receiving ambulant treatment, was reduced by half in the treated as compared with the untreated group. This diminution was entirely due to the decreased incidence of acute and subacute throat infections, the incidence of "common cold" being more or less equal in both groups. Clinically it was observed that the acute throat infection occurring in members of the treated group was similar in severity and in duration of illness to that occurring in members of the untreated group. This suggests that the use of prophylactic treatment failed to attenuate the virulence of the infecting organisms in those cases in which they were not primarily destroyed.

The favourable results obtained in this small experiment indicate that the use of an antiseptic throat spray is a justifiable prophylactic measure against such common winter ailments as acute and subacute streptococcal throat infections and influenza.

Summary

The incidence of pathogenic organisms in the throat is briefly discussed and a method of destroying them by antiseptic throat spray is suggested.

A comparison is given of the incidence of infection in two groups each of fifty naval ratings during a period of five weeks, only one group receiving prophylactic treatment.

The prophylaxis consisted of a throat spray and gargle of 15 to 20% sodium hypochlorite solution each morning on rising for five weeks.

It is shown that the incidence of acute and subacute throat infection in the group receiving prophylactic treatment was greatly diminished.

The severity of the clinical condition once it has developed is unaffected by the previous prophylactic treatment.

I am indebted to Surgeon Captain J. Bruce Ronaldson, R.N.V.R., for his co-operation and to Sick Berth Attendant J. L. Patterson for his assistance. My thanks are also due to Mr. H. C. Edgell of Milton Proprietary, Ltd., for the supply of sodium hypochlorite solution and pressure atomizers.

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MECHANISM OF PARTIAL REBREATHING IN ANAESTHESIA

BY

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With modern apparatus for gas-and-oxygen anaesthesia rebreathing is always provided for by the use of a bag, and CO_2 is eliminated by absorption or by the use of an expiratory valve. The former method (absorption) will not be considered here. The latter, by which a portion of each expiration is retained and a portion released into the atmosphere, constitutes "partial rebreathing," and may be applied to continuous or to intermittent flow. In either case the ultimate justification for partial rebreathing lies in the fact that the non-alveolar upper air-passages add warmth and moisture to the gases they contain, but take no part in real ventilation, so that any procedure which conserves their contents while still permitting adequate ventilation at a lower level is rational and beneficial, the more so that increased lung expansion and oxygenation are thereby occasioned.

Some Important Factors

In examining the mechanism of this process, consideration must be given to the following factors: (1) the "spirometer gradient"; (2) the total minute-flow of the anaesthetic mixture; (3) the total minute ventilation of the respiration and its relation to the gas flow; (4) the metabolic needs of the patient.

The "spirometer gradient" depends on the fact that the CO_2 content of the expired air increases until about 800 c.cm. has been released, the content then reaching a maximal value, which is taken as representing the common concentration of CO_2 in the alveolar field. The actual form of this gradient is shown in Fig. 1, and is of import-

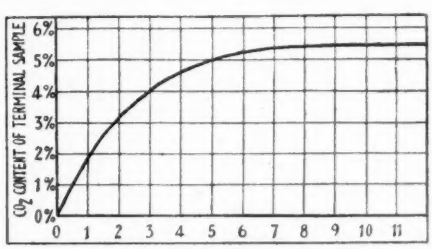

FIG. 1.—Showing the actual form of the "spirometer gradient." The horizontal co-ordinates represent depth of expiration in hundreds of c.cm.

ance in the mechanism of rebreathing. It will of course vary slightly in different individuals or from time to time in the same individual. The curve here given is based on Haldane's figures.

The extent of rebreathing is determined by the relation between respiration and gas flow. Thus if respiration amounted to 12 litres per minute, and in the meantime

6 litres of new gas had flowed into the apparatus, the difference—6 litres, or 50%—would have been rebreathed.

The effects of the process are indicated in Figs. 2–5. In Fig. 2 it is supposed that a tidal respiration of 400 c.cm. is modified by "50% rebreathing." The point

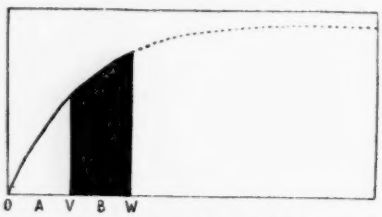

FIG. 2.—Schematic representation of 400 c.cm. tidal respiration, with 50% rebreathing. The white area enclosed under the curve at A represents the amount of CO_2 rebreathed, and the black area at B the amount of CO_2 exhaled into the atmosphere.

during expiration at which the valve opens is indicated by "V," and the end of expiration by "W." It will be seen that the upper dilute portion of the expiration, O–V, is retained for rebreathing, while the lower more concentrated portion, V–W, is released through the valve. The effective release of CO_2 is in this case performed by 200 c.cm. of deeper expiratory air. Figs. 3 and 4 make clear

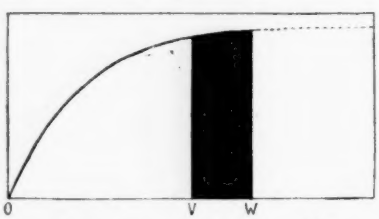

FIG. 3.—The effect of an increase in tidal respiration to 800 c.cm., with a fixed continuous flow. There is a large increase in the amount of CO_2 rebreathed, and a relatively small increase in that exhaled into the atmosphere.

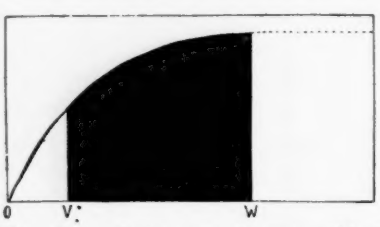

FIG. 4.—The effect of the same increase with intermittent flow. The amount rebreathed is constant, and the whole increase of tidal respiration carries CO_2 in much greater amount into the atmosphere.

the essential difference between the mechanism in continuous flow, where the volume of effective release, V–W, though movable, remains constant for a given frequency of respiration, and in intermittent flow, where it is the volume rebreathed, O–V, which remains constant.

The patient's metabolic needs must now be considered. As Guedel (1937) has pointed out, many factors tend to modify the oxygen intake and CO_2 output of the patient who reaches the operating table; but in hospital conditions these will be depressed to a minimum by resting conditions and premedication. Gesell (1939) gives for an average adult B.M.R. in the lying position an oxygen intake of 234 c.cm. per minute, representing 1.14 calories, so that if a respiratory quotient of near 1 be assumed, 250 c.cm. per minute can be regarded as a likely *maximum* for CO_2 elimination in the average adult. Now, however deeply respiration is maintained, this cannot be expired at a concentration greater than that of alveolar air, which is 5 to 6%; and if, for example, it is released in the form of a 5% mixture the real ventilation will have to be in the neighbourhood of 5 litres a minute. The volume released into the atmosphere must needs be nearly equal to the flow of gas into the apparatus; and these figures correspond with clinical experience that in using continuous-flow apparatus a gas flow of some 6 to 7 litres a minute generally ensures good results, but that if the flow is restricted much under 5 litres the patient develops signs of CO_2 accumulation.

The "Critical Flow"

This "critical flow," which if diminished is followed by CO_2 accumulation, is exactly determined in each individual by (1) his rate of elimination of CO_2, and (2) the percentage of CO_2 normal for his individual alveolar system. Since in Figs. 2, 3, and 5 the "effective release," V–W, remains constant, respiratory adjustment will take place by a shift of this fixed line to right or left, and a consequent alteration in the height of the black column and the area contained by it, which represents CO_2. It will be seen that there is a limit to the effectiveness of hyperpnoea, indicated in Fig. 5, and if this "limiting

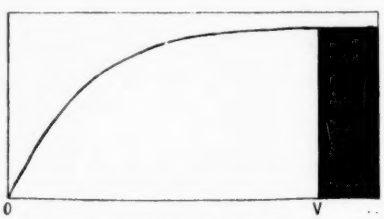

FIG. 5.—The "limiting value" with continuous flow. No matter how far the curve is produced to the right (by increased depth of respiration) the black area will not increase.

value" of CO_2 release does not account for all the CO_2 liberated in the alveoli the latter will begin to accumulate. Altered frequency of respiration will accomplish nothing, for the volume V–W is equal to the gas flow divided by the frequency, and will become contracted in inverse proportion to the latter, so that no increase in total elimination over a given period will result.

It will be seen that in partial rebreathing with continuous flow the natural respiratory mechanism is considerably modified by the apparatus to which the patient is connected. The ventilation per minute is arbitrarily limited, and the patient's efforts to modify it alter only the *depth* within the respiratory system at which the fixed ventilation takes place, this depth being *mechanically* limited by the maximum tidal exchange of which he is capable, but *physiologically* limited by the depth (about 800 c.cm.) of respiration after which no further increase in CO_2 percentage occurs.

This is in contrast to conditions prevailing in normal repiration or open anaesthesia, where increased respiratory movements at once increase both the depth and volume of real ventilation. It is also in contrast to the means of rebreathing employed in the intermittent-flow machine (for example, McKesson), in which it is the volume to be rebreathed which is arbitrarily set beforehand, and in which hyperpnoea causes an immediate increase in real ventilation, by drawing on an increased flow of gases. In this latter method the design of the bag is important. With continuous flow it matters not for this purpose how large the bag is, for it will expand sufficiently to operate the valve, and thereafter contract only by the amount of rebreathing determined by the relation between respiration and gas flow. In an intermittent-flow machine working without pressure, however, the patient must empty the bag entirely before he can draw on new gas; and provision must therefore be made for limiting its capacity to a known small amount.

Conclusions

Partial rebreathing is justified in so far as it promotes lung expansion and oxygenation, and retains the warmth and moisture of the upper respiratory contents while permitting adequate ventilation below.

Its extent is modified in the continuous-flow machine by adjustment of the gas flow, and in the intermittent-flow machine by adjustment of the bag capacity.

The patient's effective alveolar ventilation is controlled, as always, by the alveolar CO_2 concentration.

For continuous-flow machines there is a "critical flow" in the neighbourhood of 5 litres per minute for each individual, which if diminished will lead to CO_2 accumulation, but which if exceeded allows equilibrium to be attained.

Continuous flow is dangerous with a flow below the critical level; intermittent flow is dangerous with an unlimited bag capacity.

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LAURENCE-MOON-BIEDL SYNDROME, WITH TETANY

BY

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Major, R.A.M.C.

AND

DAVID FERRIMAN, D.M., M.R.C.P.

The following interesting case, considered to be an example of the Laurence-Moon-Biedl syndrome without polydactyly or mental deficiency, seems to merit publication.

Case History

A young woman aged 25 was admitted to Westminster Hospital in October, 1938. Her immediate complaint was of pain in the left loin that had been present for a week. The features which had actually led to her admission were blindness—present from birth—and attacks of tetany. These attacks dated from the age of 10, and had been occasional until nine months before. From that time they became more frequent, and just before her admission were occurring about twice a week. During the last two years she had also complained of pain in her back, for which she had been given a spinal jacket at another hospital. A report from this hospital stated that radiographs of the bones seemed normal. There was no history of vomiting. She had at one time been rather fat; with the onset of tetany she had gone to the opposite extreme, but recently she had returned more or less to normal. Her menstruation had been irregular and infrequent from the onset at 11, but the intervals had steadily increased from the minimum of three months, her last period having taken place four years ago. A further sixteen sibs of this patient had been born, of whom only five are now alive. Four of these sixteen were blind at birth, and only one is living. No abnormal fatness, tetany, or mental deficiency had affected any sibs; a sister with unaffected vision, however, had had six toes on either foot—she died early in life. The mother suffered from diabetes, but otherwise she and the father were healthy; they were unrelated.

A number of typical attacks of tetany with carpo-pedal and facial spasm were observed during the patient's stay in hospital. Chvostek's and Trousseau's signs were positive and could be elicited at any time with ease. Her veins were abnormally irritable; none were visible and no blood could be obtained from any of them, not even after cutting down and exposing them, as they went into intense spasm on the prick of the needle. Eventually blood had to be taken by needle from the femoral artery. The nursing staff had not observed any hyperpnoea. Mr. E. F. King examined the patient's eyes, and important findings are as follows: No light perception; pupils inactive to light; posterior cortical complicated cataracts; both retinae show gross primary degeneration with secondary narrowing of the retinal vessels and optic atrophy. "The picture is somewhat like retinitis pigmentosa, though the size and distribution of the pigmentation are not typical, and of course the history of blindness from birth is atypical." The patient was plump but hardly obese; polydactyly was not present. Her breast development and hair distribution were healthy. She appeared quite intelligent. She was tender in both loins and the urine contained albumin.

Special investigations gave results as follows: Serum calcium 9.2 mg., 10.9 mg., and 9.3 mg. per 100 c.cm.; plasma phosphorus 3.8 mg. and 4.2 mg. per 100 c.cm.; serum phosphatase 11 units; alkali reserve 61 c.cm. carbon dioxide %; blood urea 19 mg. per 100 c.cm. Radiographs of lumbar and dorsal spine disclosed nothing abnormal. The urine contained *B. coli*. An intravenous pyelography failed to reveal abnormality. The basal metabolic rate was +14%. The glucose-tolerance curve was normal, and the Wassermann and Kahn reactions were negative. A full blood count was normal.

The patient was put on three-quarters of an ounce of calcium lactate and 50,000 international units of vitamin D daily. Dr. G. A. Tuck, her medical practitioner, reports that she is greatly improved and that she has had only one attack of tetany in the last three months. It is interesting that her veins are now readily visible.

Discussion

Both the cause of the tetany and the diagnosis of the case are obscure. The investigations appear to rule out any of the accepted causes of tetany. An explanation was somewhat tentatively advanced by Dr. Raymond Greene. It runs as follows:

"Obesity has been present at one time; this and the amenorrhoea might be of pituitary or hypothalamic origin. A parathyrotrophic hormone is to be found in the pituitary. The increasing intervals between the periods and the variation in the obesity suggest an alteration in the level of pituitary secretion over a period of years. If the secretion of the parathyrotrophic hormone at some earlier time was high but has now sunk to normal levels (as indicated by present normal blood calcium and phosphorus figures) then it is possible that the tetany of this case is a consequence of the body's failure to adapt itself, as yet, to the relatively low calcium level."

The result of treatment with calcium and vitamin D supports an explanation along some such lines. No other hypothesis has been suggested.

We believe this case to be an example of the Laurence-Moon-Biedl syndrome. Admittedly polydactyly and mental deficiency are absent, but this has been so in other accepted cases. The absence of obesity *is* unusual, though Cockayne and co-workers (1935, 1939) have found records of this in a few cases; further, obesity was at one time present in this case. The menstrual disturbance supports the diagnosis. The obesity and amenorrhoea of the syndrome have usually been taken to indicate a pituitary or hypothalamic lesion. A lesion of such a nature in this case is further suggested by the tetany. Cockayne, Krestin, and Sorsby (1935) say, in connexion with atypical retinitis pigmentosa in this disease, that "typical retinitis pigmentosa would appear to be the exception." The affection of four other sibs, the parents being unaffected, is suggestive of a recessive mode of inheritance, and this is consistent with what is known of the syndrome (Cockayne and co-workers, 1935, 1939). The appearance of poly-

dactyly in another otherwise unaffected sib is significant and also rather typical (Cockayne and co-workers, 1935, 1939).

No other diagnosis has been advanced.

This case is described by the courtesy of Mr. G. T. Mullally, under whose care it was.

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Clinical Memoranda

A Suspected Case of Chronic Meningococcal Septicaemia

Details of the following case are submitted because it is felt that the diagnosis of chronic meningococcal septicaemia is easy if the condition is borne in mind, and because, with the present high incidence of cerebrospinal fever, there must be many cases which pass unrecognized.

Chronic meningococcal septicaemia was originally reported by Saloman (1902), and it has since been seen in increasing numbers on the Continent and in America. The only case reported in England since Stewart-Wallace (1936) recorded 3 from the London Hospital was that by Dimson (1938), which was treated with sulphapyridine. Stott and Copeman (1940) analysed seventeen cases out of a total of twenty-seven which they had seen among members of the B.E.F. in France. Stott (private communication) saw a considerable number more after the paper had gone to press, but had not seen any in this country. As pointed out by Appelbaum (1939), the condition occurs among both sexes and in all age groups. It is common before and after an epidemic of cerebrospinal fever, and is often ushered in by an acute tonsillitis or other upper respiratory infection.

CASE HISTORY

The patient was a previously healthy soldier aged 24 who had never been out of the country. He was admitted to hospital on September 5, complaining of sore throat and fever. His temperature that night was 103° and his pulse 108; his throat was red and injected. A throat swab yielded an abundant growth of haemolytic streptococci. By the following day his temperature was normal, and he made an uninterrupted recovery; so much so that he was due for discharge from hospital on September 12, when he had his first bout of fever.

On the evening of the 12th he retired to bed with a temperature of 103°, sweated, felt cold, and said that his head ached. On the following morning his temperature was normal, but a crop of spots was noticed on his legs, arms, and back. These spots were hard, raised, macular, and tender, and recurred in crops; they resembled slightly those seen in erythema nodosum. His temperature rose again on the evening of the 13th, but by the following morning was again normal: the cutaneous eruption had faded, leaving slight brownish pigmentation. On the 15th, 18th, 21st, 25th, and 26th his evening temperature rose to 102–104°, his pulse rate rarely reached 100 and never exceeded 120. A fresh crop of spots appeared with each bout of pyrexia and faded in about thirty-six hours. At no time did the patient feel ill, he was not clinically anaemic, and the spleen was not palpable.

A radiograph of the sinuses on September 11 revealed slight clouding of both antra, suggesting catarrh. A radiograph of the chest on September 20 showed the lungs to be clear. Blood cultures on the 21st, 25th, and 27th were sterile. Examination of a film of blood on the 25th revealed no malarial parasites, and the blood Wassermann reaction was negative.

A full course of sulphapyridine was begun on the 27th, and thereafter the temperature remained subnormal. The patient was discharged from hospital on October 8.

This case is interesting from the point of view of the diagnosis. Chronic meningococcal septicaemia is probably commoner than is supposed, and may become increasingly so because of the high incidence of cerebrospinal fever which has been maintained throughout the year. Its clinical recognition should be simple, according to Stott and Copeman (1940): pyrexia, associated with a relatively slow pulse, a cutaneous eruption which may be pleomorphic but is often similar to that of erythema nodosum, and the absence of malaise, wasting, and anaemia are the main points which they stress. Blood cultures in the above case were negative, and in Stott and Copeman's series there were only six positives. Cerebrospinal fluid is always normal in the uncomplicated cases. Response to sulphapyridine is immediate.

The focus of infection is as yet unknown, but it is possible that sinus infection plays a part. Rolleston (1919) quoted a case with antral infection, but pus obtained by puncture did not yield meningococci. In my case the antra were cloudy, but, as this was attributed to catarrh, puncture was not carried out.

I am indebted to Dr. L. C. Martin, physician to the hospital, for permission to publish the details of this case, which was under his care, and for help in preparation. Also to Colonel A. W. Stott, R.A.M.C., consulting physician to the Forces, for help in the final diagnosis of the case.

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The Pectoralis Major for Intramuscular Injections

The buttock, though universally recommended, has many drawbacks as a recipient of intramuscular injections. The fat-screen is variable and often massive; the marks and guides are indefinite; there are large veins, arteries, and nerves within reach (I have more than once known the sciatic nerve injected); if tenderness develops from the injection, walking, standing, sitting, and even lying down are painful. The region is apt to have unaesthetic associations, there is often hesitation in giving sufficient exposure, and falls of drapery may be embarrassing. These considerations many years ago impelled me to seek another site, and the edge of the pectoralis major was chosen; it has been used almost exclusively since, and no drawbacks have been found.

The doctor stands at the side of the patient, preferably the left. Men patients remove their shirt from that shoulder; women may usually retain their underclothes if these have fairly large armholes. The patient raises the arm sideways to a right angle; resting the hand on the doctor's right shoulder often gives confidence, and the slight pull on the arm brings the edge of the pectoralis major into prominence. After cleaning the skin with antiseptic the doctor's left thumb is placed on the axillary side of the muscle and his forefinger in front of it; the edge of the muscle is thus grasped, and a little pressure will make it tense and facilitate the puncture. The needle is inserted parallel with the shoulders and with the anterior surface of the muscle, between the thumb and finger, which serve as guides.

It is easy to direct the needle into the muscle with precision, and its penetration can be felt. There is little fat in the way, there are no large vessels or nerves in the neighbourhood, and it is not very sensitive. Ten c.cm. is accommodated with ease, 20 c.cm. is well tolerated, and absorption is rapid. The same site can be used repeatedly, though it is easy to choose different parts of the muscle. Bismuth and other opaque injections can easily be observed with *x* rays, and their absorption so watched. Pain or tenderness is rare; even with irritating materials they appear to be less frequent than in the buttock, possibly because extramuscular injection is less often achieved. If tenderness should develop the left arm can usually be rested or even placed in a sling.

Birmingham. CRANSTON WALKER, M.D., B.Sc.

Reviews

THE KIDNEY IN CHRONIC BRIGHT'S DISEASE

Architecture of the Kidney in Chronic Bright's Disease. By Jean Oliver. (Pp. 257; illustrated. $10.00. New York: Paul B. Hoeber.

In a remarkable book Dr. Jean Oliver here states the results of his continued pathological researches on chronic disease of the kidney, which were begun in collaboration with Dr. T. Addis's clinical work in their attempt to elucidate the renal lesion of Bright's disease and correlate the bedside and post-mortem findings. The great advance he has made in dealing with the problems involved is in utilizing two methods which allow demonstration of the tubules of the kidney in three-dimensional form. The first is in tearing out and isolating the tubule from surrounding tissues that have been previously macerated by a reagent; concentrated hydrochloric acid at room temperature for one or two days after fixation with 10% formalin was used. The second procedure is reconstruction in plastic wax from serial sections. The kidneys used for these studies are from the material of the earlier investigation, so that already much clinical and pathological data had been accumulated, and the present work is an objective description of the results.

The architectural unit of the kidney is the nephron, an elemental structure that includes the glomerulus and tubule to the point of its entrance into the common collecting system. The simplest modifications are increase or decrease in size, and these variations, hypertrophied and atrophied nephrons, occur in disease. In the atrophic tubule there is decrease in tubule diameter associated with loss of complexity, straightening, and shortening. The hypertrophied tubule shows increase in diameter and in its length, the result being an increase to as much as ten times the volume of a normal nephron. It would be difficult to deny the likelihood that the functional ability of the atrophied tubule is decreased, but more exact knowledge is needed before drawing conclusions as to the significance of the hypertrophied nephrons as regards function. It is shown that it is principally the terminal part of the proximal convolution which is affected. The blood supply to this part has largely been shunted straight into the efferent vessel by enlargement of Ludwig's vessel without having undergone change by passage through the glomerular mechanism, for in these hypertrophied tubules the glomerulus is disproportionately small. Moreover, in many instances of chronic Bright's disease there is obliteration of the glomerulus without their necessarily being destruction of the whole nephron, and it is probable that these aglomerular nephrons are capable of function. There are certain new elements, portions of tubules forming completely closed vesicles, but no new-formed tubules or bud-like outgrowths could be demonstrated.

Discussing the pathology of chronic Bright's disease Dr. Oliver discounts the effect of glomerular destruction in causing tubular atrophy. Regressive changes of the nephron follow sclerosis of the arteries of the kidney; but these changes may be considered a part of the life-history of the organ, the evidences of senile involution. On top of this, interstitial inflammatory reaction appears to be a considerable factor in the production of alterations in the architecture of the kidney in Bright's disease. In some instances, when death occurs early in the course of the disease, the inflammatory processes in glomeruli and interstitial tissue may be only incipient, and it is easy to understand that such kidneys, if the patient survives, should recover their normal organ structure. In more protracted cases it is possible to group the appearances ino two classes which differ fundamentally: in the first group regressive changes take place; in the second, besides the regressive changes of nephron atrophy and hydronephrotic destruction, there are added progressive alterations of hypertrophy and hyperplasia. The author believes that in the regressive form "the renal lesion proceeds uninterruptedly at a level of intensity sufficient at last to preclude the development of progressive and adaptive change. In the adaptive type, though at times the intensity of the renal lesion may be high, there are periods of remission so that vessel new-growth and the changes of hypertrophy and hyperplasia can occur." Following the contraction of inflammatory interstitial tissue, scarring may produce tubular atrophy and at times tubular hydronephrosis.

There appears to be an alteration from the normal predominantly glomerular function towards a condition of increased tubular elimination. This conclusion is formed not only on the demonstration of aglomerular nephrons but also on the blood supply being changed to a more direct tubular supply. Further, the different forms of Bright's disease, whether primarily characterized by glomerular inflammation, amyloid degeneration, or arteriosclerosis, may present kidneys in the final result remarkably similar. Further work on the lines described in Dr. Oliver's book should enable the physician and pathologist to meet with greater understanding each other's problems and to obtain a clearer view of the structure and function of the kidney in chronic Bright's disease.

MODERN DRUGS

Modern Drugs in General Practice. By Ethel Browning, M.D., Ch.B. (Pp. 236. 10s. 6d. net.) London: Edward Arnold and Co.

The rapid increase in the number of powerful therapeutic agents which the labours of the organic chemist have put at the disposal of the medical profession creates a real demand for such a book as Dr. Ethel Browning's *Modern Drugs in General Practice*. Any drug with a powerful therapeutic effect must also be toxic if not used with discrimination, and in these pages the general practitioner will find just the kind of information he requires. Naturally the great triumph of chemotherapy—the sulphonamide group—is given pride of place, and we note two interesting observations under that head. One is the curious liability of sufferers from rheumatic affections to develop two of the rarest and most severe effects of sulphonamide toxicity—agranulocytosis and encephalomyelitis. The other is the point urged in favour of combining treatment by antisera with sulphapyridine in pneumonia—that the bacteriostatic effect of the latter does not have to wait for the specific antibodies to develop before the cure can be completed. Gold therapy is next critically discussed, and the conclusion is reached that active rheumatoid arthritis is the only really satisfactory indication for its employment. (We should have liked to see Forrestier's name in the references on this point.) Then cardiac drugs are considered, including digitalis, which, though by no means a modern drug, has undergone modern developments. Here we are surprised to find no mention of the influence of digitalis on conductivity. Indeed, the whole section on the effects of digitalis and quinidine in auricular fibrillation lacks precision. Coramine and metrazol are dealt with adequately, as are the barbiturates, though not all would agree with the statement that prominal is more effective in grand mal than in petit mal. The arrangement of the chapter on drugs acting on the autonomic nervous system under Dale's classification of cholinergic and adrenergic is admirable: it will be very helpful to those practitioners

whose physiology is of an earlier date and who consequently may find the modern conceptions obscure. The remaining sections deal with such topics as hypnotics, urinary antiseptics, gastro-intestinal remedies, and external applications, including local anaesthetics. The practitioner will find this book an excellent adjunct to his library, and we expect it will reside on his desk rather than on his bookshelf.

CRIME BETWEEN THE WARS

Social Aspects of Crime in England between the Wars. By Dr. Hermann Mannheim. (Pp. 382. 18s. net.) London: George Allen and Unwin Ltd. 1940.

This book originated in the author's belief that there existed a noticeable gap in criminological and penological research which might profitably be filled by a study of the history of crime, its causes and treatment, in England during the last quarter of a century. He felt that only then had the time arrived for a detached assessment of the criminological implications of the war of 1914–18 and the period which immediately succeeded it, and for an examination of the practical working of the machinery created by the progressive legislation of the beginning of the century. His plan had to be modified in some ways, particularly by reshaping his survey of juvenile delinquency to avoid overlapping with the extensive research which had been started by the authorities. He first examines critically the structure and interpretation of English criminal statistics. He candidly recommends the non-technical reader to skip this lengthy section, but its place is obvious. It would be unsound to ask readers to accept conclusions based upon such an uncertain foundation as the English criminal statistics without a detailed study of their weak spots. He deals in separate chapters with the most significant aspects of the period between the wars, such as unemployment and strikes, business administration, alcoholism, and gambling, and with those aspects of crime which are associated with specific sections of the population, such as juvenile delinquency, prostitution, and recidivism. He has had the advantage of the support of the Leon Bequest Committee of the University of London, and has been able to use a large amount of official material. This is a real professional textbook, full of illuminating fact, in which experts in the study of every branch of crime will find much instruction.

THORACOPLASTY

La Thoracoplastie Élective : Primitive—d'Association—de Substitution. By J. Angirany, L. Michon, and A. de Micheaux. Preface by de F. Dumarest. (Pp. 128 ; 28 plates. $1.35.) Paris: Masson et Cie. 1940.

Most tuberculosis workers will agree with Dr. Dumarest that the enormous progress made in the treatment of pulmonary tuberculosis, particularly during the past ten years, is largely due to the development of a "symbiosis" between tuberculosis physician and surgeon. This monograph, written by a surgeon and two physicians, is based on four years' such collaborative work at one of the sanatoria at Hauteville, and reflects the modern tendency to confine the field of operation in thoracoplasty to the minimum required to obtain the maximum beneficial effect on the lesion ; the extent and type of rib resection, including the surgical approach and number of stages, being planned beforehand to suit each case. Indeed, the authors have nothing good to say about total thoracoplasty—"everything must be done to avoid it," a complementary phrenicectomy being preferable where a total thoracoplasty seems indicated.

Though written almost in note form the book is very readable. Essentially an account of personal experience, it nevertheless contains references to other workers, particularly in the first chapter, on the evolution of the ideas on thoracoplasty ; and there is a useful bibliography. The case reports are excellently illustrated. The indications are clearly set out. They are classified as general indications (good, borderline, poor) for thoracoplasty *d'emblée* or *primitive* ; as those for complementary thoracoplasties (*d'association*), when the operation supplements a phrenicectomy, a contralateral pneumothorax, or a partially effective pneumothorax ; and as indictions for thoracoplasty *de substitution*, when it is carried out because an intrapleural or extrapleural pneumothorax has proved ineffective. The authors stress the importance of normal tissue all round the cavity in obtaining a really good result, and the influence of this fact on the planning of the operation.

There is a good chapter on anaesthesia, in which the role of premedication is emphasized. The section on technique is detailed, but suffers from absence of illustrations. The final sections, on "results," are concerned mainly with complications (inadequately discussed) and sequelae, including effects on the skeleton, but no actual results are given except the figure of 2% as the immediate operative mortality. And there is nowhere in the book any indication of the number of patients on whom the authors have operated. The monograph will be found useful by tuberculosis physicians who wish to have more than a nodding acquaintance with details of surgical interventions.

HISTOLOGY

Bailey's Textbook of Histology. Edited by Philip E. Smith, Ph.D., Russell L. Carpenter, Ph.D., Charles M. Goss, M.D., Wilfred M. Copenhaver, Ph.D., and Aura E. Severinghaus, Ph.D. Tenth edition. (Pp. 764 ; 448 illustrations, many in colour. 33s. net.) London: Baillière, Tindall and Cox. 1940.

A Textbook of Histology. By Harvey Ernest Jordan, A.M., Ph.D. Eighth edition. (Pp. 690 ; illustrated. 35s. net.) New York and London: D. Appleton-Century Company, Inc.

Each of these new editions of two well-known American textbooks on histology has certain special characteristics which distinguish the one from the other, while at the same time they possess many points in common. Among the latter are: the width of scope and diversity of the subject-matter, which has been systematically dealt with and described in detail ; the general excellence of the illustrations, many of which are colour plates ; and an endeavour to record the results of a vast amount of recent research work on general and experimental human histology in book form, so that it is easily accessible to the ordinary reader. The two volumes differ in that the one is the combined work of five authors, whereas the other may be considered as the life's work of a single individual who has devoted his whole energy to the study of human histology. Each method has advantages over the other. The co-operative method, represented by *Bailey's Histology*, is perhaps best suited for research workers and authors as a book of reference ; whereas the work of a single author, exemplified by Jordan's *Histology*, is more likely to bear the hall-mark of individuality and be preferred by a reader approaching the subject for the first time.

Although references to the clinical bearing of certain facts of histology might be considered as outside the scope of a work on microscopical anatomy, yet, as textbooks on human histology are mainly written for the use of students of medicine, such references are of great value and add to the interest of the description. A good example of this is found in the pioneer work on the structure and formation of bone, which was largely carried out by or at the instigation of British and French surgeons, who

combined their own clinical observations with experimental and histological research. These earlier works are so fundamental that no account of bone formation or of its repair can be considered as historically complete without some reference to them. Fuller references to foreign literature, more especially to the German, Spanish, and Italian work on the central nervous system, are desirable; the two books, however, may be regarded as containing all the more essential facts of human histology, and may confidently be recommended for the use of both junior and advanced students of that subject.

Notes on Books

In *Haemophilia and Egg-white Derivatives* Dr. W. A. TIMPERLEY makes a full statement of his claim that a substance which can be extracted from egg-white reduces the clotting-time and arrests haemorrhage in haemophilia. This compilation consists largely of case-histories, but the method of preparing the extract and other technical procedures are briefly described. The theoretical argument which led to the adoption of this method is far from clear, and the reader of the brochure will probably feel that the various effects claimed for egg-white derivatives—for there are several—must be classed as empirical, even supposing that they are accepted as constant and regularly reproducible. Copies, price 6s. 6d., can be obtained from Dr. Timperley, 4, Blackmoor Crescent, Norton, Sheffield, or through Messrs. Jowett and Sowry of Leeds.

The seventy-third annual volume of *Whitaker's Almanack*, for 1941, has now appeared in three forms—at 15s. and at 10s., and an abridged edition, with paper covers, at 5s. Like many other persons, publications, and institutions *Whitaker* has not escaped war damage. Publication was postponed because bombs blasted its printers while the book was being machined, and then the home from which it had been issued for nearly three-quarters of a century was destroyed in the second Fire of London. The events of the war are chronicled in this edition, and the new departments that have been set up occupy many pages.

The Pharmacology and Therapeutics of the Materia Medica, by Prof. W. J. DILLING, is the sixteenth edition of the textbook originally written by Dr. J. Mitchell Bruce and afterwards edited jointly by Bruce and Dilling. The general arrangement has been preserved, and the text has now been brought up to date once more so as to contain accounts of all the drugs currently accepted and widely used as therapeutic agents. Important drugs of recent introduction are described, also others that promise to be of value. This edition employs the official pharmacopoeial names for drugs hitherto referred to under trade names. The book is published by Cassell and Co. at 12s.

Preparations and Appliances

ANAESTHETIST'S SLIDE RULE

Dr. WILLIAM W. MUSHIN (Honorary Anaesthetist, Seamen's Hospital, Greenwich) writes:

The anaesthetist is more interested, from a physiological and record-keeping point of view, in the qualitative composition of the gas mixture his patient is breathing than in the actual volumes of each gas delivered per minute. The intermittent-flow machines, such as the McKesson and the Walton, are calibrated qualitatively, and the percentage of each gas can be read off directly. In contrast to this the continuous-flow type of machine, exemplified by the Connell, the Foregger, and the Boyle, which has been supplied by the Government throughout the country, is fitted with flowmeters which indicate the volume flow of each gas in unit time. The anaesthetist using these machines must himself calculate the percentage composition of the mixture from these flow rates, and this calculation has to be repeated whenever the flow of any of the gases is altered. When only two gases are being used and the figures are simple, the calculation is an easy mental one. However, with more than two gases and with fractional rates of flow a mechanical calculator has proved of great value, and has made the visualization of the qualitative changes in mixture easy.

A simple calibrator has been devised which makes easy this conversion of the quantitative reading of gas flow given by the flowmeters into a qualitative form. It also indicates what flow rates will be required to produce a mixture of desired composition. The scales are logarithmic, the figures representing the logarithm of the number indicated. The principle is therefore that of the engineer's log.-log. slide rule. The calculation desired is solved by the equation:

$$\frac{\text{Volume of gas A in litres per min. } (V_a)}{\text{Total volume of gases in litres per min. } (V_t)} \times 100 = \text{Percentage of gas A in mixture } (P_a)$$

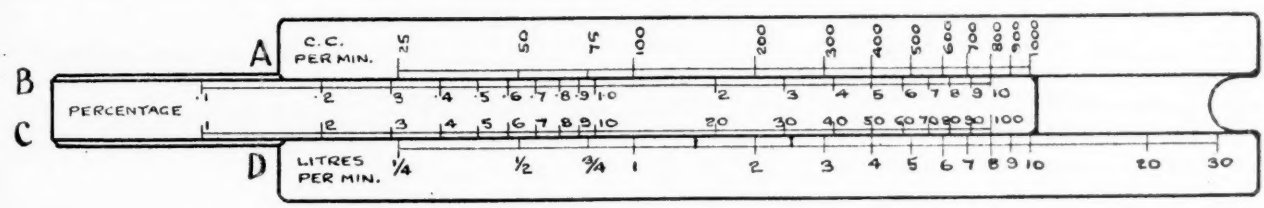
or, in logarithmic form:

$$\log 100 - \log V_t + \log V_a = \log P_a$$

The equation has thus been reduced to a simple one of addition and subtraction, and the answer can be read off on the slide rule with accuracy.

Use of the Instrument.—The anaesthetist's slide rule consists of two fixed scales, A and D, for the gas-flow rates, and two sliding scales, B and C, for the percentage figures (see illustration). For average use scales C and D only are required. Scales A and B are employed when very slow rates of flow—under one litre per minute—are being used, such as with basal oxygen and cyclopropane. The slide is adjusted so that the 100 mark on scale C (marked in red on the instrument) is exactly opposite the figure for the total volume of gases on scale D. The percentage of any gas in the mixture is read off on scale C opposite the volume-flow rate for that gas in scale D. The calculation $\log 100 - \log V_t + \log V_a$ has been performed in that order, and the answer is found in scale C.

Examples.—(1) 6 litres of N_2O, 1½ litres O_2, and ½ litre of CO_2 are indicated on the machine. What is the percentage composition of the mixture? Total volume of gases per minute = 8 litres. Move the slide till the 100 mark in red is opposite 8 litres (as in illustration). The figure 6 is opposite 75, which is the percentage of N_2O; 1½ is opposite 18½, which is the oxygen percentage; and similarly the CO_2 is just over 6%. (2) 6 litres of N_2O are flowing. What flow rate of oxygen is required to give 25%? (Simple figures have been chosen so that the illustration can be used to follow this example.) The N_2O percentage is therefore 75. The figure 75 on the percentage scale C is brought opposite 6 litres on scale D. The oxygen flow required is read under the figure 25, and is 2 litres per minute.



This anaesthetist's slide rule has been beautifully made for me by the British Oxygen Co., Ltd., Wembley, Middlesex, who propose to issue it as part of the equipment of the Boyle machine. My thanks are due to Mr. G. F. Arcus, their technical adviser, for his help and valuable suggestions.

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ANTISEPTIC SNUFFS

It is a truism that the control of air-borne infections has lagged far behind other forms of progress in hygiene. Water, food, and animals as sources of infection we know how to tackle, but aerial spread—which is responsible for a greater number of diseases than any other—continues almost unabated. More spacious buildings and better ventilation have doubtless improved matters, as have the detection and isolation of carriers as well as cases of certain infectious diseases, but widespread epidemics of influenza still testify almost every year to our powerlessness in the face of atmospheric contamination. The exigencies of war have called forth an active interest in this subject, and proposals are afoot for disinfecting air by chemical or physical means and for laying infected dust.

Where infections of the air passages are concerned an alternative is some measure of individual protection, but face masks, besides being unsightly and inconvenient, are known rather to protect other people against infection from the wearer than vice versa. That an antiseptic could be used for this purpose will have presented itself as a serious proposition to few people, in spite of the widespread use of lozenges and tablets, gargles and sprays, with the ostensible object of killing micro-organisms in the throat and nose. The efficacy of such measures is singularly ill supported, and the continuity of action necessary for prevention as distinct from cure can clearly not be secured by most of them. Nevertheless, Prof. M. E. Delafield, Dr. Edith Straker, and Prof. W. W. C. Topley, whose paper appears at page 145 of this issue of the *Journal*, have entered this apparently unpromising field and made observations which will arouse widespread interest. They speedily concluded that persistent antisepsis in the throat is an impossibility, and that attention must be directed to the nose. Here an antiseptic in finely particulate form can be widely distributed by taking it as a snuff: indeed, its distribution will be similar to that of inhaled bacteria. The clearing of secretion from the nose is much more leisurely than the corresponding process in the throat, and slow solution of an antiseptic introduced in solid form should add to the persistence of its action. A technique had to be devised for estimating the effects of this proceeding, and the quantitative method of cultivating swabs which was eventually adopted may well serve as a model for future observations in this field, where adjectives such as "profuse" and "scanty" applied to the growths obtained in culture are usually the nearest approach to any estimate of bacterial numbers. Where abnormal secretion is obtainable in bulk it would of course be possible to advance on this method by making a suspension from a measured volume, thus eliminating the main variable—which is the quantity of secretion removed by the swab. The effect of antiseptic snuffs was judged by the diminution in numbers of bacteria previously present, and noses whose secretion contained numerous staphylococci furnished the best subjects for experiment. Snuffs containing proflavine, penicillin, and sulphathiazole all caused a decided diminution in the numbers of staphylococci; proflavine was less regular in its effect, and staining is a serious aesthetic objection to its use. In several cases a diphtheroid bacillus disappeared rapidly and completely during treatment with sulphathiazole snuff.

These observations are only of a preliminary nature, and it will be interesting to see where they lead. It is fortunate that two antiseptics have at once been identified which not only secure an effect but are calculated to do no harm to the nasal mucosa. The ciliated epithelium of the nose is a delicate and valuable structure, constantly at work in the disposal of inhaled bacteria; the cinematographic demonstration of its activity, and of the impairment or cessation of this activity when even weak antiseptics are applied, given some years ago to the Section of Oto-rhino-laryngology of the Royal Society of Medicine must have convinced everyone who saw it that to tamper with this mechanism is something not lightly to be undertaken. A recent attempt at prophylaxis by antiseptic treatment of the nose must certainly have caused severe damage: this is the use of astringents (tannic acid, picric acid, alum, zinc sulphate) for tanning the nasal mucosa and so rendering it impermeable to the virus of poliomyelitis, a practice advocated in the U.S.A.[1-5] The choice of really innocuous antiseptics is small: another possible one is the bacterial extract studied by Dubos,[6] which has a remarkable action *in vivo* as well as *in vitro* on Gram-positive cocci, especially pneumococci. This substance and penicillin, which is of similar origin, have no action at all on many Gram-negative bacteria; according to the purpose for which nasal antiseptics are employed, these peculiarities in selective action will have to be borne in mind.

The main question at the moment is whether this form of treatment is going to be adopted as a means of prophylaxis—the original intention of its authors—or whether it is to be applied to the treatment of established nasal infections. The laryngologist will not be slow to adopt so novel and simple a treatment sponsored, however guardedly, by such authorities. Let us hope that he will not be disappointed, and let us hope also that careful studies may be made in order to decide what the treatment is capable of doing. The nasal diphtheria carrier—if he is old enough to learn how to take snuff—is a well-defined subject for attack; the meningococcus carrier and the sufferer from nasal catarrh due to a known and susceptible micro-organism are others. But let it not be lightly assumed that the inflamed mucosa will respond in the same way as the normal; that a profuse and purulent or inspissated secretion is as

[1] *J. exp. Med.*, 1936, **63**, 877.
[2] *U.S. publ. Hlth. Rep.*, 1936, **51**, 1105.
[3] *Amer. J. publ. Hlth.*, 1937, **27**, 103.
[4] *Canad. publ. Hlth. J.*, 1937, **28**, 493.
[5] *British Medical Journal*, 1938, **1**, 953.
[6] *J. exp. Med.*, 1939, **70**, 1, 11, 249.

favourable a menstruum for this effect as normal mucus, or that the various sinuses are as accessible to it as the main cavity of the nose. All these things remain to be found out if this form of treatment is to receive further serious study. It has further to be borne in mind that prophylaxis and treatment are very different things where an antiseptic is concerned; of the two, the former is the more likely to succeed. If either does so, it will be an unexpected achievement for a type of proceeding which it has long been customary to regard with scepticism and even contempt.

DOCTORS AND THE PURCHASE TAX

"Muddle" is not too harsh a word to describe the administration of the purchase tax so far as drugs and medicinal preparations are concerned. The situation changes almost from week to week with successive amendments issued by the Commissioners of Customs and Excise. On calling at the Customs House our representative was handed the Notice (No. 78) setting out what goods are chargeable with tax, but it was accompanied by two addenda cancelling or amending certain of the lists, and he was informed that even then the revision was not up to date. It seems improbable that any printed memorandum can ever be up to date. The continual amendments create an embarrassing position for the drug manufacturing concerns, which are having to refund tax already charged on articles newly exempted or to charge tax on articles which have been brought retrospectively under the Act. The trouble seems to arise from the fact that the tax is administered by civil servants with no real knowledge of drugs. No pharmacist is responsible, and there is no pharmaceutical control over the incidence of the tax or the choice of preparations for chargeability or exemption. Certain articles are not taxable if supplied by wholesale drug houses to chemists for industrial purposes, but are taxable if supplied either to chemists or doctors for medicinal use. A large number of simple drugs and single chemical compounds have industrial as well as medicinal uses, although the medical man may well think with regard to a number of them that their main or their only employment is in therapeutics. But they are only tax-free when not put up for medicinal, veterinary, or toilet use. Obviously a doctor would buy these preparations only for medicinal purposes, and therefore his purchases cannot be exempted. In the case of the chemist, the wholesaler, who pays the tax and recovers it at the point of delivery to the retailer, can only supply him free of tax if he is assured that the goods are not for medicinal use.

What are officially described as "essential drugs of an exceptionally costly character" are exempted altogether from tax. It is a clumsy definition, and the first list issued is obviously incomplete. Notice of revision has been given, but at the moment of writing the revision has not appeared. Examples of the drugs included in the free list are cocaine, insulin, oxygen, sera, vaccines, sulphanilamide, and hormones, including liver and liver extracts. But "hormones," according to the ruling given presumably on the advice of the Government chemist, do not include thyroid preparations. The drugs which are included in this class are free from tax no matter to whom supplied, whether hospital, doctor, or retail chemist. Another point worth noting is that diagnostic agents are free from tax. Then there is a class of drugs which is subject to a tax of 16⅔% (the full tax is 33⅓%). These include all the drugs and compounds which are the subject of monographs or submonographs in the *British Pharmacopoeia* and the *British Pharmaceutical Codex*, but there is a list of over 300 exceptions which, as already stated, are exempt from tax if the preparations are not put up for medicinal, veterinary, or toilet use. These include, for example, the salts of bismuth, iron, lead, magnesium, and sodium, also camphor, ether, and liquid paraffin, and such a preparation as benzyl benzoate, now much sought after for dealing with lice. The latest additions to this list include catechu, methyl chloride, and sulphurous acid, among other articles. A third group comprises the compounded medicinal preparations for the treatment or prevention of human or animal ailments; these again are chargeable at 16⅔%. Thus capsules, confections, emulsions, infusions, liniments, lozenges, ointments, pills, tinctures, tablets, and syrups are subject to this lower rate of tax, whether supplied to a retail chemist for re-sale or to a doctor for use in his practice.

There remain a number of articles not specified in the lists on which the Customs authorities have given specific rulings as to whether they are or are not chargeable, and, if chargeable, at what rate. Into this category, for example, come rubber hot-water bottles (which are now charged at 33⅓%). As for medicated foods and drinks, the line has been taken that preparations employed primarily for medical purposes are taxable (again at 16⅔%), but that plain unmedicated foods, like meat extracts and essences, infants' milk foods, and also foods prepared for diabetics where the preparation is intended merely to eliminate substances such as sugar and starch, are exempt. Cod-liver oil is given as chargeable in the Notice, but is now tax-free, as are cod-liver oil capsules. But cod-liver oil emulsion with hypophosphites is chargeable; only the simple emulsion is allowed to get through the index. Vitaminized glucose and similar vitaminized preparations are also now exempt, provided they do not contain any other medicaments. Chloroform is tax-free only when supplied for use as an anaesthetic or reagent.

Many anomalies remain. It appears, for example, that a chemist may buy certain ingredients, such as those of pulv. bismuthi co., free of tax, but if he buys pulv. bismuthi co. he pays tax. On the other hand, seeing that cinchona bark, cassia pods, capsicum, and similar natural raw materials, not prepared or put up as drugs or medicines, are exempt from tax, it would seem that if someone bought an entire senna shrub it would not be chargeable, but if he bought the pods nicely put up it would be. The position with regard to natural drugs is not at all clear. All surgical appliances made from fabric materials, if prepared to a medical prescription, are tax-free, but it is essential that the name of the patient as well as of the doctor should be given. The tax does not apply to surgical boots or corsets made to the prescription of a medical

practitioner, again with reference to the needs of a particular patient. All surgical dressings are exempt. Bed-pans, urinals, etc., are subject to tax at 33⅓%, and so are eye-baths, whether sold to the chemist or the doctor. Douches, pestles and mortars, inhalers, syringes, and vaporizers are not chargeable.

The really difficult point in the administration turns upon the drugs which when supplied for industrial use are exempt from the tax and when for medicinal use are subject to tax, though at half rate. The question may be asked whether the chemists are not gaining an unfair advantage, but it should be remembered that all these matters are subject to control by the Price of Goods Act, and the Central Price Regulation Committee has already issued a guide to maximum prices. The chemist is careful not to charge excessively, and he has a high reputation to sustain. He certainly has some advantage over the dispensing doctor when both are subject to the tax, because the chemist receives a higher discount from the drug houses, and, the tax being levied on the wholesale price, he pays tax on a smaller amount. Admittedly, the chemist and the dispensing doctor are not in entirely comparable positions, and commercial considerations which obtain in the one case do not obtain in the other. Nevertheless, the situation needs careful watching lest, almost by inadvertence, a different rate of tax for doctor and for chemist is perpetuated.

CEREBROSPINAL MENINGITIS

We are now entering on the season when an increase in the incidence of cerebrospinal meningitis is to be expected; and a rise is in fact occurring, though so far it is relatively small. It may therefore be of some interest to note the lessons that we learned during the major outbreak that occurred in the winter and spring of last year. The essential fact that emerged from that experience was the vital importance of early diagnosis. It is clear that the sulphonamide compounds, and particularly, perhaps, sulphapyridine, have placed in our hands a remedy which, if it is used in time, will reduce the mortality from this disease to a small fraction of its former dimensions. It is easier to secure early diagnosis among troops under discipline than among the civil population, if only because, in civilian life, the doctor may be called in too late; and the experience of last spring made it clear that many lives were being lost that would have been saved if treatment had been instituted more promptly. The practitioner can play a vital part in reducing the case mortality from this disease by exercising a constant watchfulness for the earliest symptoms, by having the cerebrospinal fluid tested promptly in any doubtful case, and by giving precautionary and adequate doses of sulphapyridine, or of sulphanilamide, while a bacteriological diagnosis is being established. Care should, of course, be taken to discontinue the drug if the laboratory findings are negative, and to inform any hospital to which a case is admitted of the exact doses that have already been given. The other lesson that we learned last year, though many had taught it before, was the uselessness of swabbing contacts. It has become clear that carrier rates of 50% or more may be found in large sample swabbings of aggregations of men among whom few or no cases are occurring. In these circumstances the isolation of a few unfortunate carriers will produce no significant decrease in the risk of infection to which others are subjected; while the inconvenience and mental distress resulting from such isolation are by no means negligible. Beyond sending to hospital or isolating the actual case our efforts may be confined to the avoidance of overcrowding, and to any other procedure that is likely to reduce the risk of the passage of bacteria from one person's nasopharynx to that of another. In the light of our present knowledge the swabbing of contacts should be discontinued.

ENTER THE INDUSTRIAL PSYCHOLOGIST

Some while ago Mr. Herbert Morrison startled the public with the slogan "Go to it"; whereupon some people had a vision of munition workers and others in industry feverishly quickening their pace until by the extra labour of their hands twenty thousand shell fuse cases were turned out where only ten thousand had been turned out before. The problem of increased production is not solved as easily as that, and it is very likely that such an acceleration would result in human fatigue and waste of material quite out of proportion to any gain. The psychologist in industry in normal times was a kind of occasional consultant, whose help was sought only by some very up-to-date firms, but under war stress he may well become a general practitioner whose services are wanted everywhere and all the time. In the factories of this country an unprecedented number of people are at present being put to new jobs, and their rapid training is an important part of the war effort. The National Institute of Industrial Psychology has issued a threepenny pamphlet on the training of industrial workers, and into a dozen pages it has compressed a great deal of wise advice. That it is possible greatly to accelerate training in industrial processes is well known to all who have given any study to this subject. It is said that operatives in one process of coil winding can now be trained in five days to a level previously attained only in five weeks, and that in spite of the intensified training the scrap rate has actually fallen. Months or even years of experience have been regarded as necessary for the newcomer in industry. But of what sort of experience? Often the experience of watching and copying a so-called experienced worker who may be quite unsuited to give any teaching and may not be employing the best procedure himself. Or it may be that the newcomer gains experience by working out his methods for himself after being told what to do, thereby learning from his mistakes—a difficult and painful process—or settling down to a second-best way of doing things, which means uneconomical expenditure of effort and too often unsatisfactory results, wasted time, spoiled material, and general discouragement. The Institute insists that the first thing to be done is to choose a trainer for new entrants into industry—a man who not only knows his job but has the ability and temperament suited for the teaching of young workers. The training should take place away from the noise and distraction of workshops, the job should be studied and a systematic course of instruction planned. In skilled trades like engineering the learner must know a great deal about the job itself, not merely concentrate on his little repetitive process. Then there is movement study on which in the past a great deal of work has been done, primarily with a view to the saving of time and energy. In very many factories no instruction at all is given concerning correct movement. The learner works out his own movements and uses many which are unnecessary. A case is mentioned in which on one particular process it was found possible to reduce the number of working elements from 265 to 148. The task of the psychologist depends on what is known as job

analysis. He takes advantage of the various improvements in movement and in the disposition of material which suggest themselves. Often it is found that only one hand is being used to carry out a job in which both hands might easily participate. Materials and equipment are not kept in prescribed positions in which they could be picked up without conscious thought (here the industrialist might learn a lesson from the disposition of the operating theatre or the first-aid post). The booklet mentioned advises as to the choice of trainer to instruct in standard procedure. It is necessary, of course, for any trainer to bear in mind that a great deal of industrial work is monotonous, and that the young people in his charge may have recently left school, where they have been accustomed to short lessons and a varied session. Therefore he will arrange for changes in activity if possible, and he will also accommodate his requirements to individual differences in ability and in aptitude for learning, which may justify certain variations from the standard procedure. The methods of the drill sergeant are not called for in industry.

PANCREATIC ENZYMES IN THE BLOOD

The determination of urinary diastase is a time-honoured procedure; the estimation of the same enzyme in the blood has been less popular, and serum lipase has suffered from a similar neglect. Interest attaches, therefore, to 616 determinations of serum lipase on 371 patients by Johnson and Bockus.[1] They consider values exceeding 1 c.cm. of N/20 NaOH as pathological, and their highest reading was 5.5 c.cm. Broadly speaking, high results appeared to indicate pancreatic disease. Thus nine out of eleven cases of acute pancreatitis and five out of eight cases of carcinoma of the pancreas gave readings above 1 c.cm. at some stage of the disease. The few positive results in other diseases could be plausibly explained on the basis of disturbance of pancreatic function—for example, nine out of twenty-nine cases of gall-stones with obstructive jaundice. But high readings were obtained in four patients with intestinal obstruction. Clinically this is unfortunate, as the diagnosis of acute pancreatitis from intestinal obstruction is one in which help would naturally be expected from estimation of serum lipase. Liver diseases, diabetes mellitus, hyperthyroidism, malignant disease, peptic ulcer, and a variety of other conditions usually gave normal results. It is pointed out that the test is unsuited to the investigation of urgent conditions, as it takes twenty-four hours to perform. The serum diastase has been studied recently by Somogyi,[2] who has evolved two rapid and improved methods of determining this enzyme: the "saccharimetric" method appears to be the most effective: it is based upon copper reduction and is expressed as the equivalent of a blood-sugar value, figures between 80 and 150 being considered normal. It is generally agreed that much-increased values are the rule in acute pancreatitis, and according to Probstein, Wheeler, and Gray[3] moderate increases may be seen in perforated peptic ulcer involving the pancreatic region. Less work has been done on chronic conditions, but Somogyi[4] expresses the opinion that low values indicate hepatic damage. No definite proof of this statement is, however, adduced, and the slight reduction of serum diastase which he reports in diabetes mellitus would appear to be better explained on the basis of impaired pancreatic function. Finally, Comfort and Osterberg[5] have compared the value of the two estimations in a large series of cases of pancreatic disease. They found that both enzymes form a good index of active or acute pancreatitis, the lipase being raised in about 98% and the diastase in about 88% of such cases. The tests should be done within ten days of the onset of the symptoms if possible. In pancreatic carcinoma, on the other hand, the lipase was elevated in 40% and the diastase in only 8% of the cases. Raised values in other conditions—for example, gall-stones, peptic ulcer, carcinoma of stomach—could always be correlated with pancreatic involvement except for a few of the cases of hepatic disease which showed slight elevations of serum lipase. It should be noted that these authors accept a wider range of normal values than those first mentioned, figures up to 1.5 c.cm. and 320 units (Somogyi) being taken as normal for lipase and diastase respectively.

[1] *Arch. intern. Med.*, 1940, **66**, 62.
[2] *J. biol. Chem.*, 1938, **125**, 399.
[3] *J. Lab. clin. Med.*, 1939, **24**, 449.
[4] *J. biol. Chem.*, 1940, **134**, 315.
[5] *Proc. Mayo Clin.*, 1940, **15**, 427.

PROBLEM OF NEONATAL MORTALITY

It is well known that the striking decline in the infant mortality rate during the past fifty years has not been equal at all ages. Over 100 years ago T. R. Edmonds in this country was one of the first to point out that it was the high death rate among infants in the first few weeks of life which accounted mainly for the high mortality figure for children under 1 year. It is generally agreed that improvement in environment and in protection against infection, more especially against intestinal infection, have been the chief factors responsible for the general downward trend of infantile mortality, but, even so, neonatal mortality remains unaltered. H. Seibert in a recent paper[1] pays particular attention to this problem of neonatal death, and discusses many factors which indicate a biological basis for the failure of the babies to survive. Age of the mother, parity, and multiple births are influencing factors and uncontrollable. The complications of labour may be averted in some instances and not in others. "If the pregnant woman," he writes, "could have the correct nourishment, good ante-natal care with rest, and if she were also free of any puerperal complications, then the newborn would issue into the world with a better chance of successfully surviving the dangerous neonatal period. But even with the best of care under the guidance of an expert obstetrician there are bound to occur some circumstances that cannot be foreseen. The process of being born is a dangerous one, and birth traumas account for a large part of the causes of death of the newborn." It is possible that in the future some of the risk of birth trauma may be reduced by the use of vitamin K to control intracranial haemorrhage, as was suggested in these columns earlier this year,[2] but Seibert notes from his study of the history of the subject that as one symptom appears to be coming under control others gain ascendancy. He thinks that there is still much to be learnt about neonatal mortality, and he is inclined to look for this, although not necessarily for a reduction in mortality, in the biological factor of constitution. One fact which favours this view is the excess mortality in male as compared with female infants. When infantile mortality rates are high both sexes are carried off more or less indiscriminately, but when the general infantile mortality rate is low it is found that more male infants die than female. This, it is claimed by some workers, is due to a purely constitutional weakness in the male sex. It is also suggested that from biological causes the fertilized ovum is "bad" from the beginning, and that no amount of protection or pre-natal care will alter the fact and prevent stillbirth or death in the early weeks

[1] *Bull. Hist. Med.*, 1940, **8**, 546.
[2] *British Medical Journal*, 1940, **1**, 839, 856.

of life. Animal studies indicate that a considerable amount of pre-natal death is normal in mammals, and even careful pathological examination fails to find any abnormal conditions in the dead foetus or infant. The term "congenital debility" only serves as a cloak for ignorance of such deaths. Despite the obvious pessimism of this biological point of view, there seems reason to hope that the problem of infantile mortality in the neonatal period may be tackled more energetically along certain lines. Better control of diet during pregnancy, rest for the mother for longer periods before delivery, longer intervals between pregnancies, and better teamwork in the management of the premature baby, are all ways in which some improvement might be achieved. Seibert's historical study indicates clearly what has been done in general for the young child and the successful results obtained. He also shows how little appears to have been done towards a solution of the problems of the newborn.

TREATMENT OF GAS GANGRENE

Little was known at the outbreak of war about the capacity of sulphonamide compounds for preventing or controlling gas gangrene, although such evidence as already existed was encouraging. It was clearly necessary to explore this neglected problem at once, and several experimental studies were set on foot in the hope of providing data which would serve as a guide to clinical policy. Anyone who has carefully studied the results already published by D. Stephenson and H. E. Ross[1] and by D. W. Henderson and P. A. Gorer[2] must have understood that this study has proved unexpectedly complex; factors affecting the therapeutic results in mice are not only the choice of drug and the species of *Clostridium*, but the toxigenicity of the strain used, the route of inoculation, and the menstruum. That subsidiary factors such as these last three should materially affect the outcome of an experiment is evidence in itself that the power of control exerted by sulphonamide compounds over anaerobic infections is far from absolute; indeed, it is probably of a lower order than its capacity for controlling infections by haemolytic streptococci. The subject has also been studied by E. Singer,[3] working at the Baker Medical Research Institute, Melbourne, and his findings agree in the main with those of other workers. They confirm the complete insusceptibility of *Cl. oedematiens* infection to chemotherapy, and the greatly enhanced therapeutic effect obtained in *Cl. welchii* and *Cl. septique* infections by combining antitoxin and sulphanilamide or sulphapyridine treatment. These experiments on this point indicate that giving a small dose of antitoxin greatly reduces the amount of drug required to secure survival; this combined efficacy of amounts of each therapeutic agent, either of which alone would be quite inadequate, further illustrates the synergic action described by Henderson and Gorer. Singer also describes experiments which suggest that desoxycorticosterone has some protective action against *Cl. welchii* toxin; since the hormone was given the day before the toxin it does not follow that this proceeding has anything more than prophylactic value, but the observation is neither an isolated one nor altogether empirical, and evidently merits further pursuit. If the results of these now numerous mouse experiments are neither as encouraging as might have been hoped nor as yet conclusive on certain points—such, for instance, as the relative merits of sulphanilamide and sulphapyridine—they do at least form an adequate basis for clinical experiment, and only by this means is useful knowledge now likely to be advanced much further. Cases of gas gangrene have presumably not been unknown among recent air-raid casualties, but we have yet to hear how they have been treated and with what results. Every such case is an opportunity for observations which may be of great value, and no effort should be neglected to secure its adequate study, which must of course include bacteriological as well as carefully recorded clinical data.

[1] *British Medical Journal*, 1940, **1**, 471.
[2] *J. Hyg.*, Camb., 1940, **40**, 345.
[3] *Med. J. Austral.*, 1940, Sept. 28, p. 275.

EMPIRE RHEUMATISM COUNCIL

The fourth annual report of the Empire Rheumatism Council is occupied largely with an account of services given to the defence Forces. Its Naval Research Foundation has continued to work with its headquarters at the emergency station of the Royal Naval Medical School; an invitation from the Royal Air Force Medical Service to assist in its plans for the treatment of rheumatic disease has been promptly accepted; and as regards the Army, the council has sought the establishment of special hospitals for the treatment of this disease. It is considered that a high incidence of rheumatic disease among soldiers is likely to arise, because, apart from other conditions of service, the intensive development of mechanized warfare makes them subject to frequent small bruising and tearing injuries and to the effects of working in cramped positions and frequent alternations of heat and cold—the environment, in fact, which is productive of rheumatic disease in industrial life. It has been deemed wise to concentrate the expert knowledge of medical men having a wide experience of the diagnosis and treatment of rheumatism in specialized hospitals; a plan to this effect has been submitted, and the council has offered its help in the fullest measure. An administrative problem, however, arises—namely, that the physical treatments which are necessary in dealing with rheumatic disease are also frequently called for in the rehabilitation of joints, muscles, and nerves injured by wounds. It is considered inadvisable to duplicate the medical and auxiliary personnel or the technical equipment, but it will not be forgotten that a very large proportion of the cases to be treated by these measures are rheumatic, and that rheumatism is primarily the care of the physician, although in many cases valuable help can be given by the orthopaedic surgeon. One of the two Sir Alexander Maclean Laboratories was suspended last year; the other continued until October, 1940, when its work was interrupted as the result of enemy action. Sir Alexander Maclean has intimated his willingness that funds from his generous gift should be diverted, as and when necessary, from the original objectives to any work for the defence services which the council undertakes. The report records the reopening in February, 1940, of the British Red Cross Clinic for Rheumatism, in Peto Place, as a most welcome restoration of treatment facilities in London. The West London Hospital rheumatism department has also been reopened.

We regret to record the death of two distinguished former officers of the Royal Army Medical Corps: Colonel Sir William Horrocks, aged 81, who was a member of the Mediterranean Fever Commission sent out by the Royal Society in 1904–5, and afterwards Director of Hygiene, War Office; and Major-General Sir George Stanistreet, aged 74, who was Deputy Director-General, A.M.S., 1918–22. The death is also announced of Dr. W. Cecil Bosanquet, consulting physician to Charing Cross Hospital and the Hospital for Consumption, Brompton.

ARMY MEDICAL OFFICERS AND MAN-MASTERSHIP

Well over a hundred R.A.M.C. officers were present when the Corps Commander, Lieut.-General A. F. A. N. THORNE, C.B., C.M.G., D.S.O., delivered his introductory address at the commencement of Corps Study Week (Medical). He began by saying he was glad of this opportunity of meeting so many of the medical officers of his Corps and that, during the short time he had at his disposal to talk to them, he wished to emphasize the important part that the medical officer could play in the life of a unit. The first and most important contribution that a medical officer could make to efficiency lay in the effort he could put forth to improve the standard of man-mastership. The principle of economy of force was of vital importance in war, and whenever a soldier, whether mentally or physically sick, was returned to duty, the medical officer had repaired some of the efficiency which would otherwise have been lost to his unit. There were literally hundreds of men who never came into the category of casualties in the true sense of the word. If the man-mastership of the unit was not of a high order these men will be the cause of a huge and avoidable loss of efficiency through their poor performance and feeble endurance. It was this avoidable loss which could and must be prevented; it could best be done by full co-operation between the medical officer and the regimental commander. The malingerer invariably appeared when hard times were experienced, but the loss of man-power through this cause must not be allowed to lessen the efficiency of the unit, which it undoubtedly would unless the medical officer took a strong line. Under a weak medical officer sick parades, instead of consisting of a few genuine cases, might come to resemble a battalion on parade.

From experience gained during five and a half years as a battalion commander, General Thorne said that the most striking lesson he had learned was the enormous amount of reliance a commanding officer must place in his padre and in his medical officer in order to raise the standard of man-mastership to a high level. Their knowledge of psychology and physiology should fit them to estimate character and to understand human nature and so to gauge the strength and endurance of individual men. While it was a mistake to impose too light a task, too heavy a task might lead to demoralization; and it was here that the advice of the medical officer should be of inestimable value.

Assessment of the Individual Soldier

The work of building up man-mastership must be done before the unit was engaged in active operations, otherwise the medical officer would be too busy dealing with actual casualties to attempt to rectify losses resulting from bad man-mastership. It was the duty of the medical officer to study and understand each individual officer, warrant officer, and senior N.C.O. in his unit; to assess character and make-up, and to note the good and bad points. He should pass on his views to his commanding officer, so that each individual might be employed to the best advantage. In this way a potential leader was not likely to be lost sight of and side-tracked by extra-regimental employment. General Thorne stressed the importance of the medical officer accompanying the regimental officers when the men attend bathing parades. It was, in his opinion, an excellent opportunity to see the men stripped and to note their physical defects, so that corrective exercises could be ordered.

All officers, warrant officers, and senior N.C.O.s must be educated in man-mastership and hygiene. The more an officer understood the complexity of the human body the better he was able to understand the involved system of control and maintenance of an army. Several books and pamphlets had been published on this important aspect of regimental life, as the result of knowledge acquired during the last war. Of these, "The Load Carried by the Soldier," by Major Lothian (Army School of Hygiene), "The Report of the Southborough Shell Shock Committee," and "The Psychology of the Soldier," by Bartlett, were good examples. If studied, they would form a solid background of knowledge and understanding which would be of great value when instructing officers and other ranks. In concluding, the Corps Commander said that, in his view, man-mastership was an art, but that medical officers, by using their technical knowledge, could make it almost a science. This should be the aim of every medical officer.

The D.D.M.S. of the Corps, Brigadier L. T. POOLE, D.S.O., *M.C.*, K.H.P., in thanking the Corps Commander for his address, pointed out that unless medical officers fully realized the importance of the points he had made they could not expect to achieve that measure of success in the preservation of man-power which was of such vital importance. Preservation of man-power by means of good man-mastership was, and always must remain, the prime consideration of every medical officer in the field. He ended by emphasizing the value of the address in that it represented the views of an experienced regimental commander.

Planning a Medical Study Week

Study Week was planned in order to give the officers of the Corps a survey, by various leading authorities, of the knowledge which had been acquired during the past sixteen months of war. Many of the officers had perhaps had little opportunity in recent months to do much clinical work or to treat many casualties due to enemy action, and a week of intensive study was arranged to keep them abreast of the recent advances in the more technical side of their duties. Two lectures, each of which was followed by a short discussion, were delivered every afternoon. Colonel J. Weddell dealt with "General Principles of War Wounds"; Colonel Ogilvie, "Abdominal Injuries"; Mr. Julian Taylor, "Head Injuries"; Mr. N. R. Barrett, "Chest Injuries"; Colonel C. Max Page, "Fracture Treatment in War"; Dr. M. D. Nosworthy, "Anaesthesia in the Field"; Dr. C. Newman, "Dyspepsia in the Army"; Colonel J. R. Rees, "Neuroses in War"; Colonel L. Colebrook, "Chemotherapy of War Wounds"; Colonel A. W. Stott, "Meningococcal Infections"; and Colonel John T. Ingram, "Common Skin Diseases and V.D." It was evident from the large attendances, not only of R.A.M.C. officers but also E.M.S. doctors, and the warm way in which the lecturers were received, that the course had been greatly appreciated.

DRESS REHEARSAL AT FIRST-AID POST

One of the first-aid posts in London which has not received a sufficient number of casualties to satisfy its large and zealous staff has, under the direction of its medical officer, instituted a system of faked casualties, which are attended with the same care and routine as if they were from an actual incident. Nothing is more depressing to the first-aid worker than to tend supposed injuries which are invisible and left wholly to the imagination. Therefore an elaborate "make-up" has been introduced under the direction of a quartermaster who is skilled in this art, and the work is carried out as carefully as anything done behind the scenes at a theatre, and is as realistic in its results. Cellophane, vaseline, and various coloured dyes are used to give a very close resemblance to the appearance of a raw wound, and in the case of one of the frequent "victims"—an orderly with histrionic gifts—the resemblance is assisted by his disordered movements and mutterings.

Instruction by Film

A cinematograph film in direct colour by the kodachrome process has been taken of the method of "making-up" these "casualties," and is available for exhibition at other first-aid posts which may care to adopt this scheme of rehearsal. A second film has been made of the "casualties" being attended by the staff, but this has not yet been released. One subject in the first film is a third-degree burn in the back, apparently extending right down to the processes of the lumbar vertebrae. Another shows the right eye apparently forced out of its socket and lying on the cheek (the secret here is that the "victim's" eye has been covered over with some paste, and the detached eye is an artificial one). As described it sounds like amateur play-acting, but watching it, and noting especially the seriousness with which the nurses and orderlies get to

work on a case, one forgets, as they do, that it is make-believe. Any feeling of unreality tends to disappear when, as often happens, the noise of London's evening barrage accompanies the demonstration, and one knows that at any moment the rehearsal may be stopped because the real thing has begun.

Volunteer Casualties

Visitors to the post may be asked to act as "casualties." One of them indicated vaguely an injury to his wrist, whereupon he was taken by the orderlies to a couch in the treatment room, where he was examined by a competent nurse and her assistants, who dressed and bandaged the "wound." Then he was labelled with the casualty card giving his name and address and description of injury, assisted to the rest room, where he was given a cup of tea, and finally sent off to hospital in dummy, as it were. One member of the staff, again, simulated a crush wound of the foot. The torn and bleeding muscles and exposed bone were admirably made up, and still more admirable was the first aid administered under the oversight, but without the interference, of the medical officer. Another demonstration was of a rescue from a supposedly bombed building of a man with a fractured femur. A small cupboard difficult of access for any team of rescuers was made to represent the bombed interior, and the rescue squad gave a fine exhibition of resource and dexterity. The bringing out of the "casualty," the application of the Thomas splint to the patient lying on the stretcher, and the dispatch of the ambulance took place in record time. Incidentally, this was carried out with everybody wearing an anti-gas respirator.

Value of Faked Casualties

Faked casualties form a really useful part of the training. They are only a part, because drill of various kinds and lectures and cinematograph films also come into the daily routine. The purpose behind it is not only to instruct nurses, orderlies, stretcher-bearers, and A.R.P. workers in the technique of first aid, but to keep them in a state of alertness and adequacy alike for the major or minor emergency.

Reports of Societies

LOWER UTERINE SEGMENT

A meeting of the Section of Obstetrics of the Royal Academy of Medicine in Ireland was held on December 20, with the president, Dr. R. M. CORBET, in the chair.

Prof. O'DONEL BROWNE read a paper on the lower uterine segment and uterine descent. He reviewed the facts known about uterine support and the relative values of the utero-sacral and transverse cervical ligaments on the one hand, and the perineal muscles and fascial floor on the other. He regarded the former as the main support of the womb. During pregnancy, he said, the transverse cervical ligaments were spread fanwise upwards as a lateral brace between the broad ligaments, stabilizing the uterus. In a somewhat similar manner the utero-sacral ligaments decussated and spread out over the posterior surface of the lower two-thirds, strengthening the new lower uterine segment and preventing the heavy fundus from falling forward. Prolonged and strong uterine contractions, or forcible delivery through an undilated cervix, might easily rupture these taut and widely separated ligamentous bands. Forcible downward traction would tear the lower fibres, detaching the vaginal vault from the under surface of the pelvic ligamentous support. The resulting pull of the unsupported cervix on the still fixed higher part produced supravaginal hypertrophy. If both upper and lower ligaments were torn the uterus would descend. High rectocele was a true hernia in Douglas's pouch, between the adjacent borders of the utero-sacral ligaments. This rather rare condition was cured by approximating the two ligaments, either from above or per vaginam. The extensive colpoperineorrhaphy which cured low rectocele was no good for the hernia.

Prof. J. KAY JAMIESON described the pelvic fascia as a sling for maintaining the genito-urinary organs in position. There was no anatomical evidence for the existence of a lower uterine segment, but it undoubtedly existed in a certain phase of life. Prof. A. H. DAVIDSON thought that three operations revealed the so-called cardinal ligaments of the uterus: vaginal hysterectomy, the Fothergill operation, and Wertheim's hysterectomy. Mackenrodt's ligaments varied greatly according to whether the uterus was pulled up or down; their division constituted one of the most difficult stages of the Wertheim operation; they had to be divided as near to their insertion as possible. The lower uterine segment arose from the isthmus of the uterus—that part to which the cardinal ligaments were attached. Dr. J. S. QUIN said that the anatomist and the gynaecologist seemed to hold irreconcilable views about the formation of the lower uterine segment. In his opinion high sliding rectocele was always due to a congenital rather than a traumatic hernia. Mr. BETHEL SOLOMONS said that the supports of the uterus were very definite and every ligament helped; section of the pelvis showed that the levator ani muscles and fascia were indirect supports through the vagina. He himself did not do the typical Fothergill operation, but cut the utero-sacral ligaments and sutured them to the front of the cervix. After anterior denudation he brought the bladder pillars, which he believed to be part of the pubo-coccygeus muscle, together in front of the bladder. To cure a prolapse it was not necessary to suture Mackenrodt's ligaments, even though they were the chief supports; in fact, the operation involved danger of including the ureter. For high rectocele he brought together some tissue high up in the vagina.

Prof. O'DONEL BROWNE, in reply, referred to a series of *x*-ray investigations in which markers had been placed in the lower uterine segment at operation and subsequently watched throughout a pregnancy. He believed that the so-called bladder pillars were artificially produced by the dissecting forceps, or by the puckering of stitches.

Amputation and Repair of the Cervix

Dr. EDWARD SOLOMONS, in a paper on the above subject, said that between 1931 and 1939, 302 women had been operated on at Dr. Steevens' Hospital; of these 104 had come to hospital for follow-up examination. The operations performed on them were Emmet's trachelorrhaphy, Schroeder's partial amputation of the cervix, and circular amputation, with a number of Sturndorf amputations. Chromic or tanned catgut was used nearly always. Careful investigation and examination showed that 94 of the women had benefited considerably, and 70 had no discharge after the operation. Backache was the commonest residual symptom, and three patients had a worse discharge after operation than before. Trachelorrhaphy gave the best results for fertility, twenty-three out of a possible thirty having subsequently become pregnant. Seventy-two patients had healed completely, and one had a bad result; the rest showed some degree of ectropion or erosion. No carcinoma was found. Among 115 cases of cervical amputation or repair performed during the last two years there had been four secondary haemorrhages within a fortnight of operation, but no sepsis of any kind.

Dr. J. S. QUIN asked the indications for operation and the history of previous treatment in these cases. He thought that some erosions would respond to being left alone, or treated with very mild caustics. The MASTER OF THE ROTUNDA asked how many of these patients were nulliparous. Dr. A. W. SPAIN thought the number of amputations of the cervix was now much less than formerly; most of these conditions could be cured by cauterizing the cervix. The cautery must be used very lightly, with great care, two or three days after the menstrual period. He was sure there was a place for posterior division in some cases. Prof. A. H. DAVIDSON said that recently he had tended to abandon operation in favour of the electric cautery, unless the cervix was much hypertrophied. He thought the results for pregnancy and labour were better. In some cases the *p*H of the vagina was rather high, and erosions would completely disappear after two or three months, or even weeks, of treatment by acid media. Prof. O'DONEL BROWNE asked the indications for amputation and curettage respectively. Dr. BETHEL

SOLOMONS said that the cautery was suitable only for very early erosions, while a careful trachelorrhaphy or amputation cured nearly every case. Certain pathological conditions predisposed to carcinoma; this made radical treatment almost imperative. He had cured so much sterility by cleaning up and closing posterior division wounds that he thought the operation should be discarded.

Dr. EDWARD SOLOMONS, in reply, said that eighteen of the 302 had been nulliparous and four of these were unmarried. In 60 to 70% some other operation had been performed.

CLINICAL PATHOLOGY AT OXFORD

At a meeting of the Association of Clinical Pathologists on January 4 at Oriel College, Oxford, and the Sir William Dunn School of Pathology, Prof. A. D. GARDNER described the diagnosis of Weil's disease by assay of the agglutinins in the patients' sera. He said that among the collections of cultures of *Leptospira haemorrhagiae* he received on undertaking this work he found a few strains which did not agglutinate with antisera made from the classical strain. In his researches and in the routine diagnostic work antisera made from these aberrant strains were used. Agglutinins appeared in the patient's serum about the sixth day. It was desirable to examine sera taken at the early febrile stage of the disease, though these were difficult to obtain, the clinical diagnosis being made usually only when well-marked jaundice appeared. Several cases of leptospiral meningitis were referred to.

Dr. JOAN TAYLOR spoke of the cultural and serological analysis of cultures from Salmonella infections sent to Oxford from many parts of England. Using the table on page 410 of the *Bulletin of Hygiene*, 1938, Dr. Taylor detailed the various antisera employed, and suggested that these should be called after the accepted group or specific alphabetical and numerical factors rather than after the confusing geographical origin. Craigie's method of obtaining the actively motile bacilli by making them swim through sloppy agar was useful.

Dr. ROBB-SMITH urged that when specimens from cases of adenopathy were obtained for the histologist the whole lymph node should be excised with proper surgical precautions and fixed before being cut across. The novocain should be injected clear of the gland; otherwise structural details of the follicles, sinuses, and medullary tissue might be obscured. Axillary or lower cervical glands were to be preferred. He surveyed the differential diagnosis of cases of widespread adenopathy, emphasizing the importance of using reticulin stains for this purpose.

Dr. C. L. COPE discussed the value of estimating pregnandiol in the urine. Absence af pregnandiol after a threatened miscarriage strongly suggested that the foetus was dead. The test was also of value in the diagnosis of deciduoma malignum, since, unlike the Aschheim-Zondek reaction, it was constantly negative in this condition. Captain HANSON described the determination in the blood of the free forms of sulphanilamide, sulphapyridine, and sulphathiazole after the administration of these drugs, the aim being to assess the optimum dosage in various clinical conditions. The conjugated forms of the drugs in the blood were not therapeutically active. It was difficult to decide an optimum concentration, for the administration of the same dose of the drug might on different occasions give different results.

An informal discussion on the future of clinical pathology was opened by Dr. A. F. S. SLADDEN. The outlines of a scheme for the regionalization of laboratory services in the Provinces had previously been discussed by the association, and there was general agreement on the advisability of a scheme in which pathologists would become officers of a regional pathological service closely allied to the regional hospital service proposed in the Nuffield scheme. It was considered to be essential that clinical pathologists should work in hospital laboratories in close touch with patients, but increasing specialization in clinical pathology made it also important that they should be able to refer the more specialized work to a central laboratory. Such a plan would ensure constant diffusion of the latest information and methods, thus acting as a stimulus to research and progress.

Correspondence

The Transfusion Problem

SIR,—Dr. Peyton Rous has kindly called my attention to your leading article (November 2, 1940, p. 597) on "The Transfusion Problem." It contains the statement that stored blood, despite the addition of glucose, cannot be kept beyond a fortnight for average use. Since the limits of storage are of vital importance in military medicine this subject should be elucidated. Criteria which might be used to establish limits of storage are the quantity of free haemoglobin in the plasma, the age at which the leucocytes or platelets disappear, the titre of prothrombin, and perhaps a dozen others. Most workers have tacitly accepted the amount of haemolysis occurring during storage as the most important limiting factor. Unfortunately the renal threshold for haemoglobin varies considerably in different individuals, so that the exact amount of haemoglobin which is safe to give cannot be stated with accuracy. We are left, then, with the task of determining the incidence of reactions in recipients receiving bloods of various ages.

In reading the numerous recent British publications on stored blood it is evident that most workers are adding relatively small amounts of glucose, so that the concentration in the blood mixture is 0.5 to 1%. This is probably done in the interests of compactness. It should be noted, however, that the original mixture of Rous and Turner contained a 3% concentration of the sugar. The modification which we are using has a similar value. From studies by Hardin, Harris, Bell, and me, which are not yet published, we concluded that the optimum concentration of glucose to inhibit haemolysis was 3% or more. To attain such a value blood can be mixed with a large volume of 5.4% glucose or a smaller volume of a more concentrated solution. The latter procedure is dangerous, however, since it results in hypertonic plasma and erythrocyte contents, so that stored cells may rupture when contact is made with the isotonic plasma of the recipient.

It is our practice to add 500 c.cm. of blood to an ice-cold mixture of 650 c.cm. of 5.4% glucose in water and 100 c.cm. of 3.2% dihydric sodium citrate in water. The blood mixture is then immediately placed in the refrigerator (DeGowin, E. L., Harris, J. E., and Plass, E. D., *J. Amer. med. Ass.*, 1940, **114**, 850). The blood-glucose-citrate is used for routine hospital transfusions with an arbitrary thirty-day limit of storage. Our first statistical study on transfusion reactions from such a practice were published in this *Journal* (DeGowin, E. L., and Hardin, R. C., 1940, **2**, 1) in the hope of calling attention to the fact that blood stored for thirty days in this preservative was perfectly safe for transfusion. At the time of publication sufficient statistics on older bloods had not been accumulated to be impressive. Up to May 1, 1940, we had given 209 transfusions with bloods stored from fifteen to thirty-eight days with only three reactions: one with chills only, one with chills and fever, and one with urticaria. This is an incidence of 1.4%. There were no patients with haemoglobinuria. On December 1, 1940, we had given over 2,000 transfusions of the blood-glucose-citrate with a thirty-day limit of storage and have found the practice perfectly safe. The oldest blood transfused was given in the course of an experiment on transportation. The blood was collected in the glucose-citrate mixture and stored for fifteen days. It was then shipped in ice by transport airplane from Iowa City to Oakland, California, and back, a flying distance of 3,539 miles. The mixture was again stored, and transfused without reaction on the forty-fifth day after collection.

Since the administration of stored blood is frequently an emergency measure in the treatment of shock, we believe much valuable time is lost and excess equipment is required in prewarming the mixture to body temperature. Prof. S. L. Baker (*Lancet*, 1937, **1**, 1390) was one of the first to report that blood transfusions given at room temperature did not result in an increased incidence of reactions. Drs. Hardin, Swanson, and I (*J. Amer. med. Ass.*, 1940, **114**, 859) transfused patients with bloods taken directly from the refrigerator without

producing reactions. The blood mixture was injected into the median basilic vein at such a temperature that the cephalic vein of the same arm felt cold to the touch, but the recipients had no discomfort. In our series of over 4,000 transfusions we have been unable to find any evidence to support the view that the blood should be warmed during administration.—I am, etc.,

The State University of Iowa, Iowa City, Dec. 31. ELMER L. DEGOWIN.

Treatment of Carcinoma of the Cervix

SIR,—In reply to Mr. Victor Bonney's letter (January 25, p. 133), I readily admit that I was unwise to make any attempt in the tables in my Bradshaw Lecture to indicate any possible "staging" of the operation cases of carcinoma of the cervix, but I did explain in the text that operators had not separated their cases into stages on the lines of the League of Nations classification. Moreover, such a division of the operation cases into stages was not material to the comparison I made or to the conclusions drawn. I should be sorry to give any false impression of Mr. Bonney's achievement, which is all the more remarkable when we learn from him that the greater number of his gland-free cases would have been radiologically classified as belonging to Stage III, for that stage comprises cases presenting one or other of the following clinical features:

(*a*) Nodular infiltration of the parametria on one or both sides, extending to the wall of the pelvis, with limited mobility of the uterus or massive infiltration of one parametrium with fixation of the uterus.

(*b*) More or less superficial infiltration of a large part of the vagina, with a mobile uterus.

(*c*) Isolated metastases in the pelvic glands, with a relatively small primary growth.

(*d*) Isolated metastases in the lower part of the vagina.

The comparison which I made between the results of operation and radiation was based on the figures for all the first three stages, excluding only Stage IV, which comprises the cases that are certainly inoperable. Taking as operable all the Stage III cases in the radiological group gave a distinct advantage to surgery in the comparison.

In quoting Bonney's figures I took them as published, except that I corrected the arithmetical calculation of his five-year freedom rate. The correct rate for 142 five-year survivors out of 366 cases is 38.8% and not 40% as stated by Bonney (*Trans. med. Soc. Lond.*, 1934, **57**, 196).

I gave most careful consideration to the problem, and must leave the figures to speak for themselves as to whether my conclusions were justified. After all, when there are rival claims it is the profession as a whole which must be convinced of the best method of treatment, for it is the general practitioner who advises the patient where to seek expert assistance. The results of the two methods of treatment for carcinoma of the cervix convinced me that the advocates of radiation therapy had proved their case, even without taking into consideration the primary mortality of the radical operation, which may be as high as 20% in a surgeon's first hundred cases. A comparison of the results obtained by operation or radiation was made by Prof. Fletcher Shaw and Prof. Dougal in cases which they treated themselves, and their conclusions were the same as mine (*Surg. Gynec. Obstet.*, February 15, 1937, **64**). A further study of the results obtained at the Middlesex Hospital is about to be published by two of my colleagues.—I am, etc.,

London, W.1, Jan. 27. ALFRED WEBB-JOHNSON.

Haemorrhagic States with Snake Venom and Lecithin

SIR,—We must plead the preoccupations of the present emergency as our excuse for not having submitted the full-dress review of our studies of the coagulant action of venom–lecithin mixtures to which Dr. H. W. Fullerton is entitled, in view of his own interesting work on the action of Russell-viper venom in accelerating coagulation.[1,2] Our observations on the inverse relation between the adjuvant action of lecithin and the number and efficiency of the platelets appeared to show something novel, and we therefore reported them first. As soon as time permits we shall publish the results of comparative studies of the various reagents used for the accelerated clotting reaction in experimental jaundice in animals and spontaneous jaundice in man. These indicate in our opinion that the venom–lecithin mixture is preferable for the determination of prothrombin times, for with venom alone anomalous results are sometimes obtained, more particularly during treatment by vitamin K. In any event it is short-sighted to think only in terms of prothrombin or to limit oneself to accelerating the clotting reaction with venom alone. When one has gone to the trouble of getting oxalated plasma and a water-bath, it is little extra work to measure the clotting times of recalcified plasma alone (Howell), plasma plus venom (Fullerton), and plasma plus venom and lecithin (Hobson and Witts). In this way three separate types of clotting defect can be distinguished—thrombokinase (haemophilia), prothrombin (jaundice), and lecithin factor (purpura haemorrhagica).

All the Russell-viper venoms we have tested show the peak of their activity at a dilution between 1/10,000 and 1/20,000, presumably because inhibitory or lytic factors come into play at higher concentrations. Although samples of the same batch are identical, different batches vary in activity a good deal. We have preferred not to work at the maximum speed of the best venoms, partly on grounds of economy and partly because it is wise not to set the level too high if successive batches are to be standardized to give identical values. Our best venom–lecithin mixtures will give accelerated clotting times of six seconds, but so great a speed is not an unmixed blessing to the observer. We have planned to make a series of statistical observations to determine the optimum activity of reagent for the purpose of the test, and in this respect it is a helpful coincidence that the venom–lecithin reagent we have chosen for these preliminary observations gives the same normal values as the acetone-dried brain extract which Quick now uses.—We are, etc.,

L. J. WITTS.
Oxford, Jan. 20. FELICITY C. G. HOBSON.

[1] *Lancet*, 1940, **2**, 195.
[2] *British Medical Journal*, Jan. 18, 1941, p. 98.

Immunization against Infection in the Army

SIR,—I was interested on reading the extract from the Harben Lectures by Lieut.-Col. H. J. Bensted (January 4, p. 187). During the last quarter of 1896 I was one of a batch of thirteen surgeons on probation for the Army Medical Service who passed the competitive examination held in London and reported for training at Netley. To all of us the lectures on bacteriology by Almroth Wright were a revelation and an inspiration. The practical course supervised by him and his assistant, Leishman, was the high-light of the whole course of training then in vogue. It aroused in us such trust and enthusiasm that I think the whole of my batch volunteered to be inoculated with typhoid vaccine. Each one had his serum agglutination titre tested before and again some weeks later. The results were uniformly satisfactory. During the summer of 1898 I served in the Nile campaign, which ended in the fall of Omdurman and the reoccupation of Khartum. The main part of the force consisted of two brigades of four regiments of British infantry. Many of these when advancing on Omdurman after the preliminary phase are said to have drunk and refilled their water bottles from a badly polluted collection of water in the Khor Shambat. The result was a severe outbreak of typhoid fever, and I myself was in charge of a great number, first in mud barracks at Darmate and later in the Citadel Hospital, Cairo. I have never seen such a virulent type of the disease in all my subsequent twelve years' service in India. A man would report sick looking as if he was in the first stage of an attack of ague. He would often be dead in seven days or less. Post-mortem would reveal an enlarged spleen and Peyer's patches uniformly swollen and inflamed, no ulceration having yet commenced. In many cases portions of the spleen were sent to the laboratory of Prof. Rupper, who cultivated *B. typhosus* from all specimens.

While serving in Peshawar (1898–1904) the incidence of typhoid was high, as it was all over India among the British troops. Again in Mhow in 1905–6 there was a serious outbreak, and it was only in the latter year that I saw any serious

effort at immunization. Even then it merely consisted in segregating the reliefs arriving for British units and inoculating the men before they were admitted to the regular barracks. Why these men were not inoculated before embarkation or during the voyage out, a period of twenty-one days, is a mystery.

The success of more universal inoculation of troops proceeding to India in later years has been remarkable. However, the crucial test came during the war of 1914–18, in which I also served. The success of T.A.B. inoculation was overwhelming, the incidence of typhoid and paratyphoid being trifling in our forces, whereas in the French forces, I believe, some 200,000 cases occurred during the first year. The debt which the whole world owes to Sir Almroth Wright in this sphere alone is immense. As one of his disciples and an original volunteer, this small tribute of homage is offered.—I am, etc.,

W. E. HUDLESTON,
Colonel, A.M.S. (ret.).

Edinburgh, Jan. 17.

Medical Planning Commission

SIR,—Like several of your correspondents in the *Journal* of January 25 (p. 131) I am seriously disturbed by the unrepresentative character of the Commission. The sixty-seven members include thirty-six consultants and specialists, nineteen general practitioners, and twelve others from various groups. But not only is the number of general practitioners disproportionately small, but even that small number is badly balanced. Of the nineteen, fifteen are from large urban areas, two from semi-rural, and two only from rural districts. Moreover, from the large number of general practitioners engaged in contract practice in colliery areas only one practitioner has been selected, and he is from Scotland, where the conditions of service and remuneration are fairly satisfactory. No possible exception could, I think, be taken to those general practitioners who have been selected, but the number of rural practitioners should be largely augmented and representation given to the colliery medical officers in the North and Midlands of England and in South Wales. I do not think urban practitioners can do justice to the special problems of rural and colliery practice, not from lack of good will but from lack of knowledge.

When first made aware of the proposed membership, I endeavoured to get it amended, but was met by the statement that the Council could not see its way to increase the number of members, already far too large. It is true that the Commission has the power to co-opt, but can this be done adequately without still further increasing an already cumbrous and almost unmanageable number?

The difficulties of this Commission are likely to be very great. Imagine a body of sixty-seven members trying to co-ordinate and dovetail the reports of its committees, some of which, if not actually antagonistic, may well be not altogether in harmony. Moreover, in practice, the balance of representation may be still further worsened by the great difficulties of travel from the Provinces at present, and yet the discussions will be vital to us all. Take one instance, the point raised by Mr. P. L. Giuseppi (January 18, p. 97)—a State medical service—what can the Commission say to that at the present juncture? For years past, as I see it, the demand for a State medical service has been becoming more and more clamant on the part of the younger members of the profession. A large number of young and middle-aged practitioners are now in a State medical service, and the list will probably be doubled before peace comes. What will be the attitude of these men to a State service when they return to civil life? Who can say? What can the Commission say? And yet, before it plans, it must have some idea on what basis it shall plan. We cannot build until we know something of the foundation on which we propose to build. Is it to be something not greatly altered from the present system, or is it to be something radically different? To my thinking, this is the vital issue to which the Commission should apply itself before any rational planning can be undertaken.—I am, etc.,

H. W. POOLER.

Ashover, Jan. 25.

SIR,—Every member of the medical profession must be vitally interested in the work to be undertaken by the Medical Planning Commission recently appointed by the B.M.A. The terms of reference are necessarily vague; but the outcome will, I take it, be a scheme for the medical servicing of this country at the conclusion of the present war.

It is certain that any post-war Government will insist on radical changes in the methods hitherto adopted for giving medical service to the public. Few if any of us would attempt to argue that considerable changes are not essential. It is almost equally certain that the Government will consider sympathetically any scheme evolved by the medical profession, provided the benefits accruing to the public are clearly shown. In the past, to certain sections of political thought, we have been suspect of self-interest in the various plans we have proposed.

Clearly it is of paramount importance for the success of any scheme that it must have the whole-hearted backing of the vast majority of the profession. Such support can honestly be given only if everyone concerned in its working has previously examined the scheme searchingly and tested its merits against those of many other possible plans. A large number of practitioners consider that a full-time State service is not only inevitable but desirable; many would view such a change as a catastrophe. The preservation of full free choice of doctor and the personal relationship between patient and doctor seems to many of us to be of the utmost importance—especially from the patient's point of view. The avoidance of a multiplicity of paper work, the inevitable tendency to a lessening of initiative (promotion on "the Services" will not prevent this), and very many other adverse features of a purely State service suggest the desirability of some other scheme.

Dr. Arthur Beauchamp (Jan. 18, p. 96) congratulates the Executive Committee and the Council on the personnel of the Medical Planning Commission. The outstanding professional status of the individual members is beyond question; in fact a more distinguished body could not have been selected. It is, however, of great importance that the personnel of a Commission elected to investigate the most vital problem ever raised in medical politics should be thoroughly representative of the entire profession. The personnel of this Commission shows an utter lack of proportion as regards both (1) age groups and (2) avocation. An approximate analysis of the personnel shows:

1. Out of fifty-seven names published (ten have still to be appointed), fifty commenced medicine prior to the end of the last war, only seven commenced medicine after the end of the last war (that is, 87.7% to 12.3%), 62% are over 50 years of age.

2. *Avocation.*—Presuming that the ten members still to be appointed by the Royal Colleges, etc., will fall under the consultant group, we have: consultants, academic, public health, etc. = 47 members; general practitioners = 20 members—that is, 70% to 30%. Surely neither such a high age-group preponderance nor such a low percentage of general practitioners can be regarded as being in any way fairly representative of the profession.

The only way to obtain a really representative view from the profession is ultimately to secure the views of the practitioners in each area. By this I do not mean merely the various Divisions and Branches of the B.M.A., but all the practitioners (B.M.A. or non-B.M.A.; general practitioner, consultant, public health officer, etc.) in each area. These meetings can easily be convened by the good offices of each local secretary of the Association.

Not one of us will have any right to criticize the future findings of the Medical Planning Commission unless he has first whole-heartedly examined all the possibilities for himself. Nor have we any right to expect the Commission to wrestle with its enormous task unless we have all given our considered opinions from time to time. It would be unfair to the Commission and unsatisfactory to ourselves to allow it to spend untold labour in producing a finished, or even a semi-finished, scheme which would then be put up for possible criticism and amendment by the Divisions and Branches.

I suggest that the Commission be asked first to draw up a framework of possible reorganization of the medical services. This should embody the main agreed points, and also the views of the minority on any point. This preliminary report could then be sent to the local secretaries of Divisions and Branches, each of whom would call a meeting (or a series of meetings) of

all the practitioners in his area. The Commission's framework would serve as a starting point; and each area would then fill in the structure according to its own views.

These local schemes would be sent to the secretary of the Commission, who would have them summarized, and would then return a composite summary to each local secretary. Having given full consideration to the new data thus obtained, each "area of practitioners" would submit its findings to the Planning Commission. From this point the Commission, with access to outside experts (Ministry of Health, etc.), would be in a position to construct a definite scheme truly representative of the views of the entire profession. The Services members would be consulted through the appropriate channels.

Eventually a concrete plan would be submitted once again to the various areas for amendment and final touching-up. The conclusions thereafter rendered to the Commission should enable it to draw up a final scheme, which would require very little discussion by the profession.

In dealing with such a comprehensive matter, so vital to every branch of medical service and to the country, the method of procedure suggested here cannot fairly be considered cumbersome. Even in these days of stress time must be found in order to construct a successful scheme. To hasten a decision, to fail in consulting every member of the profession, would be to invite disaster on a noble project.—I am, etc.,

Bath, Jan. 20. CHARLES R. GIBSON.

SIR,—Of sixty-seven names, forty are of consultants, eight are of paid officials, the other nineteen are not definitely stated to depend on general practice alone for their living. What do the general practitioners of the country think about this? How will they voice their views; how protect their vital interests?—I am, etc.,

Bradford, Jan. 4. THOMAS SAVAGE.

Medicine in a Changing World

SIR,—To me, and I expect to most of us, Sir John Orr's address to the Leeds Division (January 18, p. 73) reads as most restrained and reasonable and free from any suspicion of entering into party politics—unless his opinion that poverty had something to do with malnutrition was in your eyes entering into that forbidden field. But that was accepted by every speaker at the B.M.A. Conference on Malnutrition in April, 1939, and I remember hearing Mr. L. S. Amery going further and saying that a "great many" industries simply "could not" (not "would not") "pay sufficiently high wages to provide adequate nourishment for a family with three children." There would not therefore appear any cause for you to use this Leeds address as an occasion to give us a lecture (p. 91) on allowing our "political emotions" to warp our judgment and suggest that this had happened to Sir John. You continue, however, "This is perhaps well illustrated by reference to the subject of Sir John Orr's lecture," and your leader on this occasion makes as little contact with fact as did that unfortunate one on shelters.

Anyhow it is hoped that you will let us have another leader in which you will tell us just what your qualifications are which entitled you to lecture us on how we are to live our lives and why your remark about members allying themselves with one or other of the political parties "somewhat ostentatiously" is not just impertinence. Perhaps a prize might be offered to anyone guessing correctly what party you had in mind. It was, however, with some relief that one read that "a doctor may cast his vote as freely as any other man," for this presumably includes members of the B.M.A., although this is not made quite clear. A charming chance led you to introduce the old tag, "The cobbler must stick to his last."—I am, etc.,

Grimsby, Jan. 20. S. W. SWINDELLS.

SIR,—I think you are right in saying (January 18, p. 91) that medical men as such should not segregate themselves into political groups. That is true; since politics is not really the best kind of sociology. One who proposes to cure the world's ills by politics—that is, polemics—is like the doctor who proposes to stamp out disease by multiplying bottles of medicine. Politics and pills are at best stop-gaps or temporary expedients. True hygiene, medical and social, should make such things unnecessary. These and other parallels are very valuable, and I hold that every intelligent doctor is, or should be, a sociologist. Also, as you yourself add, "The medical profession has within its numbers those who, more than any other group of men and women, are competent to make a statement on the physiological and psychological needs of human society." I further maintain (and could prove) that this holds of the general practitioner, and, above all, of the country practitioner with his all-round field of observation and action, more than of the specialist with his arbitrarily restricted *Fach*. The truth is that in a proper system of medical services the specialists should be subordinate or ancillary to the general practitioner, not his masters as at present. That the G.P. does not always, or even generally, take advantage of his unique opportunities and thus tends to evade his social responsibilities is due to various causes which I shall not attempt to enumerate here. The facts are, however, I am sure, as stated.—I am, etc.,

Helmsley, Yorkshire, Jan. 26. A. J. BROCK.

Trends in Nutrition

SIR,—In the lecture by Sir John Boyd Orr (January 18, p. 73) many statements are made which have already been challenged by me (vide, e.g., *Edin. med. J.*, 1940, **47**, 425). There is one, however, which I have not had the opportunity of dealing with before. On page 74 it is stated: "About fifteen years ago the subject [the influence of nutrition on susceptibility to infectious disease] was investigated by a group of workers associated with the Rowett Institute, including Prof. Mackie and the late Prof. J. J. R. McLeod. In experiments with farm animals it was found that certain immunological reactions were considerably affected by the nature of the ration."

The context shows that it is to be inferred that the more adequate the diet the greater in amount are the antibodies produced and the less the susceptibility to infectious disease. Apart from the misuse here as elsewhere in the article of the word "nutrition," it has to be stated without reservation that no such conclusion could warrantably be drawn from the results of these investigations as they are recorded in the *Lancet* of May, 1931 (**1**, No. 5622) and the *British Journal of Experimental Pathology*, 1932, **13**, 328.

Since they had been cited by him in published articles and otherwise on previous occasions in support of his present thesis, I naturally expected mention to be made here of certain other observations on similar lines conducted by himself and subordinates during this same period. As a consequence of these it was alleged that the addition of a mineral supplement (containing a high proportion of calcium) to a ration of bran and barley conferred on the rabbits receiving it protection from the effects of an intravenous injection of human tubercle bacilli. I am able to state quite categorically from the protocols and other highly pertinent details, both of which I possess, that this claim should never have been made.—I am, etc.,

Aberdeen, Jan. 18. J. P. MCGOWAN.

SIR,—It was with profound horror that I read one sentence in Sir John Boyd Orr's otherwise fine article, "Trends in Nutrition" (January 18, p. 73), in which he said: "The Canadian Medical Association has published an excellent booklet showing the kind of diet needed for different families and the cost, and has thereby *adjusted propaganda to economic realities*" (my italics). Stated in less "diplomatic" language this would read: "The Canadian Medical Association has published an excellent booklet showing not only the kind of diet needed for different families, but also the cost, thereby instructing us that we must popularize diets in relation to their cost and not to their suitability, for there are many people without sufficient money with which to purchase the best." Dietetic realities essential for health are to be subservient to "economic realities."

The tragedy of the statement lies not only in the fact that we are directed to prostitute our guardianship of the people's health but in that it is the product of old-fashioned thinking. The fundamentals of the sentence are, first, that there are certain dietetic needs which are known to exist. They are necessary for the health of the body, which was made by God and not by man. No man can lessen those needs by suggestions, laws, regulations, high cost, or any other means; they are absolute. Every fresh research shows that our know-

ledge of them is incomplete. Every advance of knowledge reveals further needs, not reduced requirements. Economic realities, on the other hand, are statements about supply, effective (monetary) demand, purchasing power, credit, and so on, put out by economic experts as being fundamental implications of inexorable economic laws. But, be it noted, all economic "laws" are man-made and are controllable and alterable by man.

It will be recalled that "the sabbath (which used to be governed by many laws) was made for man, and not man for the sabbath." In precisely the same way economic laws were made for man and not man for the laws. They were originated to facilitate man's life and private and commercial exchanges, and to simplify barter. That they have been perverted into a means of power, of control of all man's activities and even of his health, is no justification for statements such as Sir John's. It is our privilege and our duty to resist such evils and to insist that man shall be able to live a full life.

Lest it be thought that my words are merely the scribbling of some obscure person let me quote those of Lord Horder in an article in the *Sunday Times*. It will be seen that I am in the company of the great ones of the profession. "If I were made a Dictator for the purpose of doing only one thing as a contribution to the Good Life, I know what I would do. I would put the Ministers of Health, Agriculture, and Transport into a room together and keep them there until they had settled the problems of food production and food distribution in this country. *The only person* I would allow them to send for to help in their deliberations would be the *Governor of the Bank of England*" (my italics).—I am, sir,

Manchester, Jan. 24. W. SAYLE CREER.

Working of A.R.P. and First-aid Services

SIR,—We have had in your columns a most interesting correspondence on equipment, etc., for use in air raids. I have been wondering for some time if correspondence or articles could not be introduced on a similar line but embracing matters on a much larger and more general scale.

It would be of the utmost value and at the same time of the greatest importance if the views of the medical officers of health and general practitioners and hospital officers could be obtained as regards the working of the A.R.P. and First Aid Services. Those who have had the fortune—or should I say misfortune?—to have actual experiences in this matter could in this way give their findings for the benefit of those who have not been in an area attacked. I feel that there must be many minor modifications in the original plans and many errors which have had to be corrected. It appears to me to be a great pity that these errors should have to be repeated in all areas, whereas were those who had had experience—and there must be many now—to give their views either in the form of correspondence or a series of articles all this could be saved.

I have been much surprised that the Ministry has not obtained such views from a questionary to medical officers of health and then informed others of the modifications found necessary in the light of actual events. I feel that there must be many slight changes which would improve such services in the area of which I am in charge, yet I cannot introduce them for lack of practical experience, and there must be many more in a similar position.—I am, etc.,

Jan. 19. R. E. JOHNSON, M.B., Ch.B.

The Mobile Unit in Action

SIR,—Dr. E. K. Macdonald (January 4, p. 30) states that it is difficult to envisage any situation in a city where a mobile unit can prove of more value than the ordinary fixed post. May I cite this instance:

The procedure our controls adopt now is to call out, first, the medical officer and sister with stretcher car to the incident. Should the medical officer see fit to call out the unit he does so. This was the procedure adopted one Sunday night recently. On arrival at the site I found high explosives had been dropped in neighbouring streets, in all of which the houses were more or less completely demolished. Near by one crater five people were entombed and required my attention. While engaged here, four messages came from adjoining streets for help. I decided to call out the unit. Once this arrived I dispatched a nurse to each street armed with hypodermic syringe, morphine, coramine, and dressings. The two men in the shift plus the driver acted as liaisons, fetching hot bottles and blankets to various cases. The nurses acted admirably, not only in relieving pain but in standing by the casualty for hours, and keeping torn tissues clean and free from falling mortar and debris, and administering restoratives. One case is worthy of mention—that of a young man with two-thirds of scalp avulsed. A nurse stood by this man for four hours; whenever the rescue party rested she stepped in and swabbed away debris from scalp and applied fresh pads. Surely this is not a singular case (now doing well and surely saved from sepsis by this nurse).

It is interesting to read various reports for and against the mobile units, each varying according to various doctors' experiences. Dr. J. J. Cremin's experiences at Coventry made him question (December 14, p. 847) the utility of mobile units, particularly when his unit was destroyed. Granted that a mobile unit exposes itself to great risks, this is no argument for its abolition. The crux of the question is this: Is there a need for immediate skilled treatment at this site of an incident prior to removal to hospital or is there not? Speaking as a medical officer of a mobile unit in perhaps the second worst-struck borough in London, I say there certainly is a need.

How many seriously wounded trapped cases did Dr. Cremin leave behind? Are there not trapped wounded cases at most incidents which cannot be whipped off to hospital? I agree that it is not wise to call out the whole unit in every case, but the procedure adopted here obviates the unit going to the wrong or smaller incident. These units cost £3,000 a year in trained personnel alone. Surely this is not going to be wasted. Rather would I advocate more use being made of them, but at the discretion of a medical officer at the site of the trouble rather than at the discretion of Controls, who are instructed by the local warden, with his multitudinous duties, which incidentally have never yet been defined.

May I state here my admiration of all branches of A.R.P. organization and the excellent work they are doing, but who is the "boss" at an incident? I find in my experience great need for co-ordination and leadership.

I should like to state in closing this letter that as a combatant officer in the last war I owe my life to first aid in the field.—I am, etc.,

J. F. MACKIE,
Jan. 20. M.O. Mobile Unit.

SIR,—We should like to refer to, and constructively criticize, some points which have been brought to notice in the letters of your correspondents on this matter.

During the months of September, October, and November, 1940, the two Paddington Mobile Units have been in action many times and dealt with 107 casualties. In only three of these incidents did a complete unit with van turn out. On twenty-two occasions the team consisted of a medical officer, two nurses, and a stretcher-bearer whose duties include liaison, besides the driver of the car. The car was uncomfortably full when appliances were added to personnel.

The chief difficulty experienced was to get to the scene early enough. In Paddington the "Blitz" has not been nearly so intense as it was, for instance, at Coventry. It transpired that the wardens first on the spot were in the habit of asking Control primarily for a stretcher party. These men are most efficient and keen; but zeal has sometimes outrun discretion in their endeavour to save time. The presence of a mobile unit (or part of it) with its medical officer is nearly always necessary; the unit should work, not in competition, but in unison with the stretcher party, and they should be called out simultaneously. Often the mobile unit has not been ordered out because the wardens have not asked for a medical officer or, if asked for, it has been so long after the incident occurred that nearly all the casualties have already been dealt with, and the medical officer is only required to administer morphine or a general anaesthetic, or to certify death. As speed is the essence of success in our work, procedures of an operative nature, however tempting, are not, and should not be, undertaken unless, of course, life is in immediate danger. The administration of CO_2 or CO_2 + oxygen has been called for.

Although the "Blitz" has eased up in London during the last six weeks, and the utility of mobile units has been questioned, we are solemnly warned—and the warning comes from those who are in a position to know—to expect further and more serious trouble during the next ninety days.—We are, etc.,

R. GALWAY MURRAY.
S. CROWN.

London, W.2, Jan. 20. M.O.s i/c Mobile Units.

The Problem of the Shelters

SIR,—With reference to Prof. J. R. Marrack's letter (January 11, p. 61), the remark of mine regarding drainage problems to which he draws attention related to Haldane's deep shelters as distinct from the surface type. With regard to his final remark that the labour and material necessary for effective indoor shelters would be prohibitive, it would be a grave disservice to the community for this to be allowed to pass unquestioned. The fact that in a great many cases these could be provided at a cost of £4 per head seated, or £8 per head in sleeping bunks, is some indication that the labour and material involved would be much less than Prof. Marrack fears.—I am, etc.,

Rugeley, Staffs, Jan. 17. H. MASON.

Pregnant Women in Target Areas

SIR,—As a practising obstetrician I view with grave concern the failure of the local authorities to evacuate pregnant women from the large maternity units under their care in areas which are well known to be likely targets for enemy aerial attack. In many cases these hospitals have already suffered damage and casualties among the patients; yet no effort has been made to evacuate the patients or even to move them to the periphery of the city. I fear that the attitude of the Ministry of Health in preventing local authorities from establishing maternity units in the country outside the city boundaries is being seized upon and made an excuse by those who are opposed to evacuation.

To carry out systematic midwifery and deal with abnormal cases under the constant threat of aerial attack is exceedingly difficult, nor can the training of pupil midwives be satisfactorily carried out. Despite this, some of our maternity hospitals are being booked with almost the same number of cases as in peacetime, and the Central Midwives Board regulations for training remain unaltered.

During aerial activity there are few more to be pitied than the full-time pregnant woman, and none more worthy of our consideration. I trust that some action may be taken while there is yet time.—I am, etc.,

Jan. 20. A MIDLAND PRACTITIONER.

Dyspepsia in the Army

SIR,—May I put forward these suggestions to supplement Mr. Reginald T. Payne and Dr. Charles Newman's "Interim Report on Dyspepsia in the Army" (December 14, 1940, p. 819). (1) How many of these cases from France indulged in the raw wines of France, obtainable at the estaminets, as compared with beer drunk here? (2) What further steps can be taken for men proceeding abroad to ensure all bad teeth are extracted, and where necessary new dentures provided before they are allowed to embark? (3) Could not some means be devised whereby the records we so laboriously kept of panel patients in peacetime be made available to recruiting medical boards. Would it not save the country a great deal of money and save the medical services much valuable time?—I am, etc.,

C. C. H. CHAVASSE.

Malaria Therapy in General Paralysis

SIR,—The recent death of Prof. Julius Wagner-Jauregg at the age of 83 years calls to mind the fact that the method of treating general paralysis by the inoculation of benign tertian malaria, which constitutes the late Professor's most notable contribution to clinical medicine, is still largely empirical, although this circumstance does not detract from its undoubted value as a therapeutic measure.

It is generally believed that the beneficial results of malaria therapy in general paralysis and certain other diseases of the nervous system are attributable to the direct or indirect effects of suddenly induced pyrexia upon the *materies morbi* or its toxin. In general support of this view I am tempted to record my personal reaction to a primary attack of benign tertian malaria deliberately acquired, *not* as a therapeutic measure but in the course of an experiment. During the hot stage the mental faculties were exceptionally clear, the imagination vivid, and several ideas regarding work then in progress flashed through the mind, some of which were actually followed up later.

I would not have ventured to record so trivial an incident lest I be charged with "presuming on an ague's privilege," but this does not apply to the account given by Wallace of how, after many years' study, he came to formulate, independently of Darwin, the theory of natural selection. Speaking of the year 1858, when he was at Ternate, Malaya, Wallace, in a letter dated December 3, 1887, reproduced at page 189 of the *Life of Charles Darwin* (1902) by his son Francis Darwin, states: "I was lying on my bed (no hammocks in the East) in the hot fit of intermittent fever, when the idea suddenly came to me. I thought it almost all out before the fit was over, and the moment I got up began to write it down, and I believe finished the first draft the next day." In a footnote the editor states that in another and later account of the same incident Wallace speaks of the "cold fit," instead of the "hot fit," of his ague attack, but doubtless the earlier account is correct, since the sole preoccupation during the cold stage is how to become warm.

The above facts lead one to wonder whether the beneficial effects of malaria therapy in general paralysis may not be attributable, in part at least, not so much to pyrexia, *qua* pyrexia, but to the blood supply of damaged cerebral tissue being permanently improved by the opening up of blocked capillaries during the hot stage.—I am, etc.,

C. A. GILL,
Reigate, Jan. 13. Colonel, I.M.S. (ret.).

Electrical Convulsant Therapy

SIR,—Our attention has been drawn to an article by Dr. E. B. Strauss and Mr. A. MacPhail in your issue of December 7 on convulsion therapy.

As manufacturers of convulsion therapy apparatus to the design of Mr. W. Grey Walter we would like to correct the statement at the foot of page 780 that he uses direct measuring current for determining the patient's head resistance. In our apparatus the resistance is measured with alternating potential applied to the electrodes, as in the original apparatus used by Fleming, Golla, and Walter. A descriptive booklet on the Ediswan apparatus is attached, and for the benefit of inquirers we would add that the price is £40 complete, net. Orders are being executed in rotation, owing to the difficulties attending present-day manufacture.—We are, etc.,

THE EDISON SWAN ELECTRIC CO. LTD.,
RADIO DIVISION.

*** We have referred this letter to the authors, and print below the reply from Mr. A. MacPhail.

SIR,—Reference is made to the paper by Fleming, Golla, and Grey Walter in the *Lancet* (1939, **2**, 1353). They describe how the patient is switched over to low-tension circuit, and voltage is adjusted until 1 mA flows through the head. From this the resistance is calculated. Because of the considerable discomfort caused by the passage of 1 mA of alternating current trans-temporally, and since the nature of the current was not mentioned, it was assumed that the direct current was used, as it is much more tolerable when gradually increased to this magnitude than the alternating current, and, indeed, we did not see why an already difficult patient should be subjected to electro-sensory changes for the mere measurement of resistance, especially when the current can be easily kept below the threshold of sensibility for measuring purposes. In our instrument this is done, and the patient at no time feels any electric sensations whatever, as Fleming, Golla, and Grey Walter admit their patients have.

We beg to tender our apologies for the statement that Mr. Grey Walter uses direct current for measurement of the trans-

temporal resistance, but when the nature of the current was not mentioned we believed that our inference was fair, knowing the discomfort of 1 mA of alternating current through the brain.

Our equipment is being manufactured by Electro-medical Engineers to our specification and is contained in a small attaché case at a cost of £40 complete.—I am, etc.,

Jan. 13. ANGUS MACPHAIL.

Oxygen Therapy

SIR,—In their valuable letter (January 18, p. 98) Mr. S. M. Cohen and Dr. W. W. Mushin have aptly drawn attention to the difficulties attending oxygen administration. This valuable therapeutic agent was used by Beddoes as far back as 1800, and in 1865 an oxygen administration apparatus was actually patented by Geo. Barth, who used it widely with apparent success.

Considering the paramount importance of oxygen in physiology, pathology, and therapeutics it is surprising that its use has been so long neglected. For is not oxidation the fundamental basis of all organic physiology, and diminished oxidation the basis of all organic pathology? Rationally, therefore, increased oxidation should be the primary aim of therapeutics. While agreeing with the writers of the letter as to the apprehension of patients and relatives being often an objection to its use, I would suggest two other considerations which also make the treatment unpopular—namely: (1) the heavy and cumbersome apparatus, and (2) the cost. Neither of these difficulties need be encountered to-day, for a new type of short cylinder with a flat base, enamelled black with chromium-plated tap-fitting containing 100 cu. ft., not too heavy and fitting readily into most doctors' cars, can now be obtained.

With regard to cost, I think it is time that oxygen was controlled and made available to all doctors at a reasonable price—certainly not more than that charged to garages, oxy-acetylene welders, etc. At present I am obtaining oxygen in the cylinders described above from a firm which delivers it from a distance of thirty-five miles at an inclusive total cost of 3s. 9d. per cylinder, or £1 17s. 6d. per 1,000 cu. ft. Another firm only seven miles distant offered to supply similar cylinders at 9s. 6d. per cylinder—that is, £4 15s. per 1,000 cu. ft. As 100 cu. ft. of oxygen usually lasts about twenty-four hours it will be agreed that a cost of 3s. 9d. per day is within the means of almost anyone.

For several years I have administered oxygen in general practice by means of a small oxygen tent, which I think is preferable to the inhalation mask, especially in children. Treatment is begun in the early stages of illness, usually when the patient is obviously not in danger, and no anxiety is caused to either the patient or the relatives. I have used it in cases of pneumonia, pulmonary collapse, embolism and oedema, bronchitis, asthma, cardiac failure, whooping-cough, diphtheria, intestinal distension, narcotic and carbon monoxide poisoning, in children and adults, in all types of homes, usually with striking effect. Oxygen is a life-saver.

I hope that the Medical Planning Commission will arrange for the proper distribution of oxygen at a proper price. If it does, the profession and the public will soon be convinced of the extraordinary value of this simple remedy.—I am, etc.,

Liverpool, Jan. 20. ARTHUR G. C. FFOLLIOTT.

Adie's Syndrome

SIR,—The letter of Mr. R. Foster Moore (January 18, p. 99) claiming to have described this condition six or seven years before Adie illustrates the grave danger of eponyms. There can be no doubt that Mr. Foster Moore's communication (*Trans. ophthal. Soc. U.K.*, 1924, **44**, 38) has never received the recognition which it has deserved, probably due to the specialized nature of the journal.

But the pupillary condition was described by Ware in 1813, and later, in 1902, by Strasburger and also by Saenger. Its association with alteration of deep reflexes was recorded by Markus in 1905 and Gehrcke in 1921. All these authors can therefore claim priority over Mr. Foster Moore. Probably further probing into the literature would establish the fact that the condition was described even before 1800. I recall the aphorism of Kingston-Fowler, "To be original it is necessary not to read too much." I wonder if this haggling over priority would occur if Sir Jonathan Hutchinson's suggestion—that conditions be named after the patients in whom they were first seen—were followed.—I am, etc.,

Mitcham, Surrey, Jan. 21. MAURICE H. PAPPWORTH.

Medico-Legal

PRACTICE IN INSANITY DIVORCE SUITS

A petition for divorce on the ground that the respondent has been under care and control as a person of unsound mind for the five years immediately preceding the petition must necessarily be supported by medical evidence. Medical superintendents of mental hospitals are busy and responsible people, and attendance as witnesses in divorce actions throws an appreciable burden upon them. At the instance of the Official Solicitor, who usually acts as the guardian *ad litem* of the patient, the President of the Divorce Division recently instituted a practice whereby medical superintendents may in certain circumstances be allowed to give their evidence as to the state of mind of the patient by affidavit.[1] The procedure should, the President said, be used only where the medical superintendent can express, with reasons, an unqualified belief in the incurable unsoundness of mind of the respondent, and in the continuance of the care and treatment during the whole of the five years immediately before the petition. The affidavit also gives the medical superintendent an opportunity to deal in appropriate cases with other relevant matters, such as the provision of extra comforts for the patient. The superintendent's belief in the incurability of the patient must be unqualified. The President remarked that the words "It is my belief that the respondent is unlikely to recover" do not express such an absolute belief. Unlikelihood or improbability of recovery may be a very different thing from incurability. The new procedure is only apt when a medical superintendent feels himself able to express reasons for saying that the patient cannot be cured.

A SUCCESSFUL SILICOSIS APPEAL

It seems hard that the interpretation of a single word in a statute should make a vital difference to the life of a poor family. In deciding a recent appeal[2] the House of Lords were able to reconcile precision, common sense, and humanity. The compensation of workmen disabled by silicosis is dealt with by the Various Industries (Silicosis) Scheme, 1931. Compensation under this scheme may be paid only to workmen employed in a list of specified processes, one of which is the "crushing or grinding of silica rock, or any handling incidental to such crushing or grinding, or crushing or grinding of bricks or other articles containing not less than 80% total silica." A workman had to reline a furnace, and before doing so had to break down the old layers of silica brick. These, being cemented hard, required the use of crowbars, and the new bricks often had to be chipped into shape. Both processes generated large quantities of silica dust inside the cavity. The workman contracted silicosis from inhaling this dust and applied for compensation. The county court judge concluded that the workman was employed in "crushing" the bricks; but the Court of Appeal disagreed, largely on the ground that in other parts of the scheme "breaking" is mentioned as well as "crushing or grinding," and therefore seems to be regarded as a distinct process. Viscount Simon, however, on appeal to the House of Lords, agreed with the county court judge that the work inside the furnace could properly be called "crushing" the brick. The applicant had not only to cut the brick down by crowbar and mallet, but also to break down the old lining with sledge-hammers. This, he thought, comes within the dictionary definition "to compress with violence so as to destroy natural shape or condition; to comminute." His Lordship added that it must not be assumed that the application of one word in a scheme always excludes the possibility that another word may be applied to the same operation.

[1] *Times*, November 29, 1940.
[2] Forster v. Llanelly Steel Co. (1907), Ltd. 1941. 1 All E.R. 1.

Some crushing may justly be called breaking, and some breaking may amount to crushing. The other learned Lords agreed, and Lord Wright said that breaking and crushing both mean disintegration, and the difference is one of degree. In questions of the line between the application of one word and that of another the functions of the judge are peculiarly important. The judge's application of the word "crushing" to the facts could not be called insensible or such as a reasonable man could not make. The judge's order for compensation was therefore restored.

Universities and Colleges

UNIVERSITY OF OXFORD

The following medical degrees have been conferred in Convocation:

D.M.—Alice J. M. T. Barnes.

B.M.—E. Emanuel, C. M. Bisset, J. B. Searle, M. G. C. Ashby, B. S. B. Wood, P. E. Coffey, J. P. Rochford, E. J. S. Barthorpe, A. M. Jockes, G. E. Milne, P. A. L. Roberts, R. H. Gaman, *E. E. T. Taylor, *G. P. Mahar-Loughnan, *S. F. M. Cressall.

* In absence.

UNIVERSITY OF CAMBRIDGE

At a Congregation held on January 25 the appointment of Dr. T. S. Hele, F.R.C.P., Master of Emmanuel College, as deputy for the Professor of Biochemistry was continued to the end of the present academical year.

The following medical and surgical degrees were conferred:

BACHELORS OF MEDICINE AND SURGERY.—(By proxy.) J. S. Hesketh, M. R. Pollock, F. T. G. Prunty, M. A. Fawkes, O. Clarke, D. MacG. Jackson, L. Read, P. F. Milling, R. C. Tufton, D. W. M. James, R. Morton, C. S. N. Swan, W. R. Burkitt, W. McC. Scott, J. O. D. Williams, A. G. Farr, L. A. Little, H. D. L. Campion, F. J. Y. Wood.

UNIVERSITY OF ST. ANDREWS

At a graduation ceremony held last month the following medical degrees were conferred:

M.B., CH.B.—R. B. Davidson, J. MacP. Jolly, Muriel Mackenzie, Christine N. R. Stalker.

SOCIETY OF APOTHECARIES OF LONDON

The Gillson Scholarship in Pathology of the Society of Apothecaries of London has been awarded to Dr. Helen M. Wright for the year 1941.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

A quarterly meeting of the Council was held at the College House on January 25, with the Vice-President, Mr. Eardley Holland, in the chair.

Membership

The following were elected to the Membership:

Alice Josephine Mary Taylor Barnes (London), Arthur Patrick Barry (Dublin), Donald Rose Beaton (R.A.M.C.), Stanley Arthur Bond (London), Margaret Muriel Burton (London), Archibald Sutherland Duncan (Edinburgh), Howard Roderick Duval (London), Jack Joseph (London), Hugh Cameron McLaren (Aberdeen), John Clifford Newbold (London), Richard Braithwaite Keevil Rickford (London), Kenneth Garratt Seager (Croydon), Kantilal Chandulal Shah (Bombay), David Chalmers Wiseman (Leicester).

Malcolm Thomas Drummond (Sydney) was admitted to the Membership *in absentia*.

The President, Prof. W. Fletcher Shaw, was reappointed to represent the College on the Central Medical War Committee, and Mr. J. P. Hedley was renominated representative of the College on the Council of the Queen's Institute of District Nursing.

CONJOINT BOARD IN SCOTLAND

The following candidates, having passed the requisite examinations, have been admitted L.R.C.P.Ed., L.R.C.S.Ed., L.R.F.P. & S.Glas.:

M. A. Attia, R. R. B. Baxendine, M. Berman, R. H. Brundage, D. Collins, M. M. Dinowitz, M. Dirdack, M. L. A. El Diwany, S. C. J. Falkman, S. Finkelstein, Eleanor Franks, H. H. Frumin, J. Glass, A. A. Goldstein, G. Kilgour, I. Krauthamer, T. Lyle, D. MacKay, W. L. Milligan, Z. F. Nakhoda, R. M. Norwell, K. I. Peckitt, B. Schneider, W. Schreiber, H. J. J. Schwartz, M. Serlon, J. Simpson, F. Stein, R. Stewart, W. J. Taylor, H. B. Wender, T. Yong-Leng, A. H. Zidan.

The following graduates of recognized foreign universities were also admitted Licentiates:

E. Cohnreich, G. David, S. Geliebter, H. E. Haas, B. Hermann, E. Tiscenco.

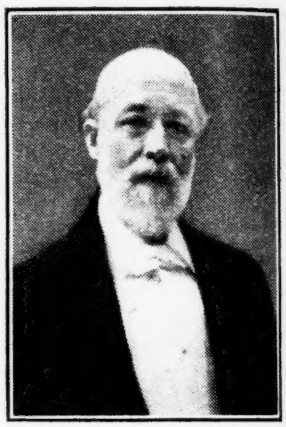
Obituary

FRANK T. PAUL, D.SC., CH.M., F.R.C.S.

Consulting Surgeon to the Liverpool Royal Infirmary

Mr. F. T. Paul, the well-known Liverpool surgeon, died at his country home at Grayshott, Hindhead, on January 17, in his ninetieth year.

The son of Mr. Thomas Paul, he was born at Ashwood Lodge, Norfolk, and educated at the Yarmouth Grammar School. After a short time at a commercial office in London he entered Guy's Hospital, and qualified M.R.C.S. in 1873 and L.S.A. in 1874. After a year's residence as house-surgeon in Guy's he left London for Liverpool to spend the rest of his professional life in that city. His first appointment was that of resident medical officer at the old Royal Infirmary. This brought him into contact with the medical school—the nucleus of the University College and later on of the University of Liverpool. His extraordinary talents were soon recognized, and he rapidly scaled the whole range of appointments that Liverpool could offer him. Successively pathologist, lecturer in dental surgery, surgeon to the Southern and Stanley Hospitals, professor of medical jurisprudence, assistant and later full surgeon to the Royal Infirmary, he retired from the Infirmary in 1911 with the well-deserved reputation of being one of the leading surgeons of his day.



He had taken his Fellowship in 1878, and the University of Liverpool honoured him by bestowing upon him *honoris causa* the Mastership of Surgery and the Doctorate of Science. He was an enthusiastic supporter of the Liverpool Medical Institution, filling all its offices, and becoming its president in 1906 and 1907. He attained his jubilee of membership in 1925, and at the Centenary Meeting in 1937 he was elected an honorary member. Some years ago he gave to the Institution his presentation portrait and a model of his hand cast in bronze, a souvenir suggested by the original mind of the late Mr. Frank Jeans. On this interesting occasion Jeans spoke of the importance of delicacy of touch in a surgeon, whereupon Paul remarked that "a gentle touch comes from the heart rather than the hand—a touch inspired with a true sympathy for the patient's tissues."

Paul wrote little; a textbook on domestic economy and the article on intestinal obstruction in Binnie's *Surgery* were his chief publications. With a few exceptions—those in the *Transactions of the Pathological Society*—nearly all his papers were issued in the *Liverpool Medico-Chirurgical Journal*, and consequently did not reach the wide publicity among the profession that their contents merited. On the occasion of his seventy-fifth birthday his colleagues and friends collected all this material into a birthday volume of *Selected Papers*, which was published by Baillière, Tindall and Cox. This volume is of great interest, as it shows Paul's wide knowledge and originality. In it may be seen his first paper on colotomy in 1891, in which the use of Paul's tube is first mentioned, and the subsequent paper on colectomy in which he had perfected the method, often erroneously ascribed to Mikulicz,

who did not write of it until at least ten years later. In 1892 Paul wrote of his improvement on Senn's method of gastro-enterostomy by bone plates; substituting a bone ring for the bone plate and suggesting that the site should be the posterior and not the anterior wall of the stomach for the anastomosis. In 1894 he described an original method of amputation of the hip-joint, and as early as 1897 we find that he had done a partial thyroidectomy on six cases of exophthalmic goitre without a single death. In addition the book is full of microscopical studies of dentine, Nasmyth's membrane, chronic mastitis, and prostatic enlargement. Truly a remarkable achievement for one of that time.

As professor of medical jurisprudence he was often in court as an expert witness, and it is interesting to recall that he was called for the defence in the famous Maybrick case, when apparently the medical profession was as divided in its opinion as was the country generally. When the last war broke out, Paul as an *à la suite* officer was put in charge of the surgical division of the 2nd Western General Hospital at Fazackerley with the rank of major. He did splendid work there as well as in the many subsidiary hospitals on both sides of the Mersey. He had been a member of the British Medical Association for sixty-six years, and gave the Address in Surgery at the Liverpool Meeting in 1912.

Paul's surgical life spanned the change brought about by Lister. He often said that on his arrival in Liverpool the first surgeon he saw to wear suitable clothing for an operation was Edward Bickersteth, senior surgeon to the Royal Infirmary, who was a personal friend of Lister's. Paul early recognized the importance of the antiseptic system and the wide prospect it offered to the surgeon. He was a very hard worker, and soon found, to his surprise, that he alone was doing as many operations in a year as the whole staff of Guy's did in his house-surgeon days. His fame spread beyond the confines of Liverpool both as a brilliant surgeon and as an inspiring teacher. Modest and self-effacing to a degree, he was entirely without affectation, and was always ready to give a helping hand to his junior colleagues. It is difficult for anyone who saw Paul operate to speak of his work without superlatives. Moynihan himself said he was the neatest operator he had ever seen. When over 70 he performed delicate operations with a speed and dexterity which many younger men could not emulate.

He was very versatile, and in his younger days was a keen yachtsman, camper-out, and photographer. He was also an early motorist, doing his own running repairs. Gardening was perhaps nearest his heart, and he was something more than an amateur. In later years it remained his chief hobby and delight, and he grew orchids with great success at Grayshott. He expended on gardening the same skill and enthusiasm that he had given to surgery, bent always on the advancement of his craft.

Paul's name has already its allotted place in surgical history, but generations of students to whom he unfolded the fascination of surgery will remember him not only as a brilliant teacher but also as a kindly friend and wise counsellor. R. E. K.

[The portrait reproduced is from the presentation picture painted by G. Hall Neale.]

ERNEST W. LEWIS, M.D., F.R.C.S.Ed.

We have to record with much regret the death on January 17 at Birkdale of Dr. Ernest William Lewis, honorary consulting surgeon to the Southport Infirmary and for many years an active worker in the British Medical Association. Dr. Lewis was born in South India on July 10, 1875, son of the Rev. Edwin Lewis, and from Keyford School, Frome, Somerset, went to Edinburgh University in 1892 to begin the study of medicine. He won distinction at the final M.B., Ch.B. examination in 1898 and commendation for his M.D. degree in 1906, and later obtained the F.R.C.S.Ed. Soon after graduation he held the post of house-surgeon at the Mildmay Hospital, Bethnal Green, and then returned to South India as surgeon in joint charge of the London Missionary Society's hospital at Jammalamadugu, a post he held for six and a half years. At Southport he became a member of the local bench of magistrates and served as mayor in 1933–4. Dr. Lewis joined the British Medical Association in 1900: he was honorary secretary of the Southport Division 1922–8 and chairman in 1929–30. He represented his Division at seven Annual Meetings and was president of the Lancashire and Cheshire Branch in 1934–5. At headquarters he had been a member of the Journal Committee since 1937 and also served on the Central Council during the same period. He was a member of the Liverpool Medical Institution and a Fellow of the North of England Obstetrical and Gynaecological Society.

A colleague, W. A. M., writes:

Graduating with distinction, Dr. Ernest W. Lewis spent some years in India, coming to Southport to engage very successfully in practice over thirty years ago. During the war of 1914–18 he worked at one of the local war hospitals. At this period his health broke down, and for some months he had to keep indoors after sundown. Undeterred, he prepared himself for and obtained the Fellowship of the Royal College of Surgeons of Edinburgh in 1918. Soon after he joined the staff of the Southport Infirmary, doing good work and interesting himself in the building of a new out-patient department, which had become necessary. When he retired on reaching the age limit he was chairman of the medical board. During this time he had filled the office of mayor of the town and been chairman of the local Branch of the B.M.A. In the present emergency he was vice-chairman of the Local Medical War Committee, joined the medical service, and as long as strength permitted worked as surgeon to the Southport War Emergency Hospital. When he recognized the inevitable, as unfortunately he had to some months back, he told his friends of his illness and carried on. Devoted to his family and his profession, he found time and energy for his municipal work, his flowers, and photography, but in the later part of his medical life his interest in and devotion to the work of the B.M.A. seemed to his friends the "ruling passion." When I called on him a few days before death and when anodynes at frequent intervals were necessary, Lewis wanted my opinion of the "Medical Parliament." So he leaves us with the memory of a calm courage all must admire and many of us envy.

J. R. KAYE, M.B., D.P.H.

Dr. James Robert Kaye, who served as county medical officer of health for the West Riding of Yorkshire for thirty-three years, has died at his home in Hove, Sussex, aged 85. A native of Perthshire, he received his medical education at the University of Glasgow, graduating M.B., C.M. in 1880, and taking the D.P.H. of Cambridge nine years later. While still an undergraduate his attention was drawn to the importance of hygiene by an outbreak of diphtheria, and he decided to devote his life to this branch of medical service. He was appointed M.O.H. for the West Riding in 1896; he reorganized the sanitary administration, and some twenty-five years ago had an important survey made of housing and sanitary conditions in the area under his supervision. He took an active interest in all sides of public health work, and arranged every year a "health week" for the West Riding. At the international congress of the Royal Institute of Public Health at Ghent in 1927 Dr. Kaye received the triennial award for conspicuous work in the cause of public health. He retired from his post in 1929; during his tenure of it the infantile death rate in the West Riding fell from 165 per

thousand to less than 80. In retirement on the Sussex coast he became honorary secretary of the Brighton, Hove, and Worthing Branch of the National Society for the Prevention of Cruelty to Children. He had joined the British Medical Association in 1893, and served as vice-president of the Section of Public Medicine and Industrial Diseases at the Bradford Annual Meeting in 1924. He had been president of the Yorkshire Branch of the Society of Medical Officers of Health, and during the last war held the rank of lieutenant-colonel R.A.M.C.(T.) as D.A.D.M.S. of the 2nd West Riding Division.

PROF. MAX ASKANAZY

In a recent issue of the *British Medical Journal* (writes Dr. Lina Potter) the death of two veteran professors of Geneva University was recorded: Prof. Cristiani of the Public Health Section and Prof. Max Askanazy of the Pathological Institute. Prof. Askanazy attracted many foreign students to his classes, and others in England besides the writer must have profited by his teaching. As a research worker he published work on the experimental propagation of cancer and on a wide number of other subjects. He was safe rather than daring, and when he published new work it was well documented and represented an enormous amount of investigation. He was the collaborator of Aschoff and was responsible for a section of his book. In July, 1939, a few weeks before the outbreak of war, he had just resigned his professorship at the age of 73 and was looking forward to attending a conference in the U.S.A. and to "a quiet time" of retirement to investigate a hundred and one subjects which had attracted his attention but had been put aside for routine work. His place as writer, teacher, and researcher, above all as an indefatigable worker in pathology, will be difficult to fill.

Dr. BENJAMIN MORGAN LEWIS, formerly of Sunnyside, Pontypridd, Glamorgan, died on September 28, 1940, at Bath. Son of Benjamin Lewis, Glanbarden, Govilon, Abergavenny, he was educated at Bath College and University College and Hospital, London. After qualifying M.R.C.S., L.R.C.P. in 1888, he at once went to Pontypridd and practised there for nearly fifty years. Dr. Lewis was one of the founders of the Pontypridd and District Hospital. An active member of the British Medical Association, which he joined in 1890, he was also a member of the Glamorgan Insurance Committee and Glamorgan Panel Committee. He married Marian, daughter of the Rev. David Wassell of Bath, who survives him with four sons and one daughter. "R. M. H." writes: I should like to pay tribute to this really great general practitioner. He is one of the many "Unknown Soldiers" who form the backbone of the medical profession. His passing removes one of the grandest type of general practitioners. He was indeed guide, counsellor, and friend to all his patients. He was held in the highest esteem by the members of his profession and on more than one occasion was urged to be a president of the Branch, but he shrank from publicity and preferred to carry on his good work in the background. His loss is deeply mourned by his colleagues and patients.

We regret to record the death on January 4, at the age of 77, of Dr. JOSEPH STEWART of Leeds. Dr. Stewart was born at Castlederg, Co. Tyrone, and was educated at Queen's College, Galway, and the Royal University of Ireland, where he took the degrees of M.B. and M.Ch., both with honours, in 1887. He had held the post of demonstrator in anatomy at Queen's College, Galway, and in 1889–90 he won a travelling scholarship, visiting London, Paris, Vienna, and Berlin. On his return he went into partnership with the late Dr. Robinson of Leeds, and soon afterwards married Miss Elizabeth Ann Miller of Galway, who died some years ago. Of his three sons only Dr. Barry Stewart, also of Leeds, survives him, one son being killed in the war of 1914–18 and another, Dr. Joseph Douglas Miller Stewart, who was in partnership with his father, died just over a year ago. Dr. Stewart had been a member of the British Medical Association for forty-nine years.

Dr. HENRY EDWARD SKYRME, whose death at Bournemouth occurred on January 12, was for many years a prominent and highly regarded practitioner in Cardiff. In his youth he was a chemist, but he forsook this for medicine and proceeded to the London Hospital, where he had a distinguished career, taking several medals and scholarships. Qualifying in 1888 with the Conjoint diplomas he then became a house-physician in the London Hospital, and not long afterwards settled in Cardiff. His success in practice was immediate and he soon built up one of the largest and best practices in the city, which he maintained until he retired to Bournemouth in 1922. He was a member of the British Medical Association for thirty-two years, and took an active part in the proceedings of the Cardiff Division, especially in the hectic Insurance Bill controversy of 1911; he was also a member and a former president of the Cardiff Medical Society. "G. I. S." writes: Dr. Skyrme led an active and a full life, and he was a most amiable man and a cheerful companion. He was an enthusiast in the early days of motoring, and possessed one of the first motor-cars in Cardiff. His wife died a year or two ago, and he is survived by an only daughter, who is married. Dr. Skyrme was one of the "old school," and the news of his death comes as a wistful reminder to those of us who are old enough to have known them and to have worked with them that the members of that esteemed generation are dropping off one by one.

Dr. DAVID RENNET, who died at Upton, Chester, on January 13, was the son of the late Mr. David Rennet of Aberdeen. Dr. Rennet was educated at the Aberdeen Grammar School and Aberdeen University, where he graduated M.B., C.M. in 1889, subsequently obtaining the D.P.H. at the same university. He received the degree of M.D. with commendation in 1893. Following a few years' general practice he became Assistant M.O.H. for Aberdeen City. He also was assistant professor of medical jurisprudence and public health in the University of Aberdeen, having been appointed in 1892. In 1911 he succeeded Dr. J. R. Currie (now Prof. Currie) as Medical Officer of Health for the city of Chester. Having been in the R.A.M.C. since 1907, Dr. Rennet was called up for service on the outbreak of the last war in 1914. He became specialist sanitary officer to the Western Command and was demobilized with the rank of brevet lieutenant-colonel in 1919. He subsequently received the M.B.E. During the tenure of his appointment in Chester many improvements in the public health were initiated by him, and he had the full confidence of the City Council. When he retired in 1932 he received presentations from past and present members of the City Council and members of the medical profession in the city, besides a presentation from the staff of the Public Health Department. He was a past-president of the Chester Caledonian Association, of which he was a member for many years. His wife died in 1936 and he is survived by two daughters, one of whom is a member of the medical profession. His loss will be keenly felt by many members of the medical profession and in particular by those who were fortunate to work under him in the Public Health Department in Chester. He was a member of the British Medical Association for twenty-one years.

Dr. GEORGE JAMES WILLIAMS, formerly of Haltwhistle, Northumberland, died suddenly on January 16 at Peterstone-super-Ely, Glamorgan. He was born at the beginning of 1865, and from University College, Aberystwyth, went to Newcastle-on-Tyne College of Medicine to study for the medical degrees of Durham University. He graduated M.B., B.S. in 1892 and proceeded M.D. in 1905. Dr. Williams was for a time surgeon to the G.W.R. at Fishguard, and Rosslare harbours and railways. He held a number of medical appointments at Haltwhistle, and during the last war was civilian medical officer to a brigade of the R.F.A. at Featherstone Park Camp. After moving to South Wales he became medical officer to the St. Fagans district of Glamorgan. He had been a member of the British Medical Association since 1894.

We regret to announce the death of Dr. HUGH BRINDLEY OWEN, D.S.O., which took place on January 17 at Penzance, where he practised as an ophthalmologist after a long period in the Uganda Medical Service as ophthalmic specialist and as

medical superintendent and principal of the Medical School of Mulago Hospital. He was born in 1879 and began the study of medicine at Caius College, Cambridge, which he entered in 1897, and afterwards at St. Bartholomew's Hospital, graduating B.Ch. in 1906 and M.B. in 1907. In the following year he took the D.T.M. and H. and went out to Uganda, and served with much distinction in the last war, being awarded the D.S.O. and the O.B.E. He took the D.O.M.S. of the English Royal Colleges in 1926, and after settling in practice at Penzance was elected ophthalmic surgeon to the West Cornwall Hospital in that town and to the West Cornwall Miners' and Women's Hospital at Redruth. He joined the British Medical Association in 1913 and served as Representative of the Cornwall Division at the Centenary Meeting in London in 1932. "Roddy" Owen, the name by which he was known to his many friends, was a prominent Rugby football player at Cambridge and at Bart's, for which he played as centre three-quarter in many inter-hospital matches at the beginning of this century.

DR. JOHN FLETCHER HORNE was born at Barnsley, Yorkshire, in 1848, and received his medical education at Leeds and Edinburgh, qualifying in 1874, and later obtaining the F.R.C.S.Ed. At the time of his death he was the senior Fellow of that College. After serving an assistantship with Dr. James Braithwaite of Leeds, he acted as house-physician to Sir Clifford Allbutt at the General Infirmary, Leeds. He began practice in Barnsley in 1876, retiring in 1926. During his period in general practice he obtained the M.D. of St. Andrews University, and in 1896 was elected a Fellow of the Royal Society of Edinburgh. In 1894 he published a small volume on trephining, its ancient and modern aspects. From 1880 to 1900 Dr. Horne served on the surgical staff of the Beckett Hospital, Barnsley, and on retirement was appointed consulting surgeon. He was a member of the Barnsley Town Council for thirty-three years, and was mayor of that borough in the years 1900 and 1901. He was a Justice of the Peace for the Borough of Barnsley, and also for the West Riding of Yorkshire. He was a medical referee under the Workmen's Compensation Act, 1897, for thirty-two years. He had been a member of the British Medical Association for sixty-five years.

Dr. J. B. Horgan writes from Cork: The personality of HERBERT TILLEY has so permeated British rhinolaryngology for nearly two generations that only time can reveal the profundity of his loss. While never a pioneer Tilley early assumed a dominating position in his specialty and was always ready to bring an unbiased erudite and extremely ripe judgment to bear upon any question pertaining to his art. It was a natural sequence that his colleagues of all ages and in many lands learned to respect and indeed to rely upon the opinion of this courteous English gentleman. Tilley was always *au courant* with the cavalcade of progress which has attended the modern practice of surgery and medicine and applied this knowledge to his teaching and his practice. To quote his own simile, it is not enough for the labourer to till his own furrow, but he needs must cast his eyes upon the surrounding land and take note of the cultivation being carried out by his neighbours. The man has gone, but the gold of his endeavour will long remain as an inspiration to all those who were privileged to know him as a teacher or a friend.

We regret to announce the death of Dr. GEORGE WILLIAM HARVEY BIRD of Bridgwater, who was not only in private practice there but also held a number of public appointments, including that of medical officer of health. Dr. Bird, who was the son of a Kidderminster solicitor, received his early education at King's School, Worcester, and his medical education at Cambridge and St. Thomas's Hospital, qualifying M.B., B.Ch., and also M.R.C.S., L.R.C.P. in 1893. For a time he was house-physician and clinical assistant in the skin department at St. Thomas's, but in 1898 he went to Bridgwater as assistant to Dr. W. L. Winterbotham. Shortly afterwards they became partners, and when Dr. Winterbotham died Dr. Bird continued the practice himself. In 1923 Dr. Bird was appointed medical officer of health and school medical officer for the borough. Other official posts he held were those of medical officer of health to the Port Sanitary Authority, medical officer to the Post Office, and surgeon to the borough police force. He was appointed a member of the honorary medical staff of the Bridgwater Hospital in 1900, and at the time of his death was the senior member; he was keenly interested in the work of the hospital. With all his public work he found time for many other activities; he was a member of the Local Medical War Committee, chairman of the council of the Bridgwater Hospital League, while the work of the St. John Ambulance Brigade and the A.R.P. services also claimed his time and interest. He had been a member of the British Medical Association for forty-four years, and was chairman of the West Somerset Division in 1933–4. An appreciation of his services to the borough was given by the chairman of the education committee at a recent meeting: "Most of us came to regard Dr. Bird as something of an institution. He took great interest in every matter of importance in the town. He had very broad sympathies and wide interests. Not only will he be missed as a medical officer of health and by the education authority, but the town generally will miss him. It is the passing of a great gentleman and an accomplished medical man."

The death of Dr. JAMES BELL at the early age of 42 is severely felt by Trinity College, Dublin, of which he was a Fellow and lecturer in biophysics. He graduated M.B., B.Ch., and B.A.O. in the University of Dublin in 1934, afterwards taking the M.A., the Sc.D., and the M.D. degrees. Dr. Bell was a Fellow of the Institute of Chemistry and of the Chemical Society, to whose journal he contributed papers on the preparation and hydrolysis of guanidine and on the preparation of methyl and dimethyl guanidine. He had been a member of the British Medical Association since 1935.

The Services

HONORARY SURGEON TO THE KING

Colonel H. Stott, O.B.E., I.M.S., has been appointed Honorary Surgeon to the King, vice Colonel F. F. S. Smith, I.M.S., retired.

AWARDS

MENTIONS IN DISPATCHES

Surgeon Lieut.-Commander Kirk Forsythe, R.N.V.R. (H.M.S. *Cairo*), has been mentioned in dispatches for courage and endurance in action against enemy aircraft in Norwegian waters.

Corrigenda

In the list of officers whose names have been brought to notice in recognition of distinguished services in connexion with operations in the field, March to June, 1940, published in the *Journal* of January 4, the following were omitted: *Commands and Staff:* Colonels T. S. Blackwell, A. L. Foster, R. K. Mallam, O.B.E., M.C., and F. R. B. Skrimshire.

In the list of officers whose names have been brought to notice in recognition of distinguished services in connexion with operations in Norway, published in the *Journal* of January 4, the name of Colonel J. E. Rusby, M.C. (Commands and Staff) was omitted.

In the list of officers mentioned in dispatches, published in the *Journal* of January 4, the name of Colonel A. C. Searle should read Colonel A. C. Hammond Searle and that of Major A. E. King should be Major A. C. King.

CASUALTIES IN THE MEDICAL SERVICES

ROYAL NAVY

Surgeon Lieut. THOMAS JAMES MORTON, R.N.V.R., lost his life at sea in January. He was the only son of Dr. J. L. Morton of Colyford, East Devon, and received his medical education at Charing Cross Hospital, qualifying M.R.C.S., L.R.C.P. in 1936 and taking the degree of B.Ch. of the University of Cambridge in the same year. He had held the posts of house-physician, house-surgeon, and casualty officer at Charing Cross Hospital, and at the outbreak of the war was medical officer to the Hull and Sculcoates Dispensary. He joined the British Medical Association in 1938.

ROYAL ARMY MEDICAL CORPS

Wounded

Captain Douglas Blyth Milne.
Captain (War Substantive) Arthur Lloyd Potter.

Medical News

The Right Hon. Walter Elliot, M.P., F.R.C.P., formerly Minister of Health, has been appointed Director of Public Relations at the War Office in succession to Major-General J. H. Beith.

A meeting of the Shaftesbury Military Hospital Medical Society will be held at the hospital on Tuesday, February 4, at 3 p.m., when Major Barbour will speak on "Morale in Time of War."

A meeting of the Society of Public Analysts and Other Analytical Chemists will be held at 2.30 p.m. on Wednesday, February 5, at the Chemical Society's Rooms, Burlington House, Piccadilly, London, W.

The Chadwick Trustees recently offered two prizes of £100 and £50 for essays on the construction and management of air-raid shelters, with special reference to ventilation, heating, sanitation, and the provision of sleeping accommodation. They have awarded the first prize for the essay submitted jointly by Phillip O. Reece, A.M.Inst.C.E., and S. L. Wright, M.D., M.R.C.P., D.P.H., of Wembley, and the second prize to Jocelyn F. Adburgham, L.R.I.B.A.

The British War Relief Society in New York has promised to contribute to St. Dunstan's £5,000 a month for the next five months, and has also made a gift of £5,000 to the British Hospitals Association to increase and ensure the supply of radon.

In a message of appreciation to local authorities the Minister of Health, Mr. Malcolm MacDonald, said that owing to the need for giving little publicity to air-raid damage the public had not fully grasped the capable way in which local authorities had shouldered the heavy burdens thrust upon them. Local authorities had borne much of the brunt of the battle for Great Britain. The rescue of people from damaged buildings, the care and treatment of the injured, the repair of houses and of water and sewage mains, and the rehousing of the homeless were only a few of the tasks that had fallen on them and their voluntary and regional helpers. Local authorities in reception areas had been called upon to deal with increases in population of anything between 50% and 70%, and had managed to do this cheerfully. There had been some shortcomings and some failures, but generally local authorities had risen to the occasion with resource and efficiency.

The names of Dr. Matilda Carson Welsh (Salford) and Dr. Thomas Philips Cole (Beckenham) have been brought to notice for brave conduct in civil defence.

Reports that it is not possible to get treatment at Droitwich are incorrect. Accommodation is, it is true, limited, and should therefore be engaged well in advance. The St. Andrew's Brine Baths are open, and so are the rheumatism hospitals and hostel. Information can be had from the local Spa Association.

Medical Notes in Parliament

Administrative Duties of R.A.M.C. Officers

Captain MARGESSON, in reply on January 22 to Dr. Morgan, said many officers of the R.A.M.C. were engaged exclusively on administrative work which could not be efficiently performed by laymen. He was not aware of any disquiet among medical practitioners in consequence. Certain appointments were being reviewed which had in the past been held by medical men but could, with an adjustment of duties, be held by non-medical men. Some medical officers had already been replaced.

Fortified Bread

Answering questions on January 22 by Sir Ernest Graham-Little and Mr. De la Bere, Mr. HARCOURT JOHNSTONE, on behalf of the Ministry of Food, said the cost of fortifying white flour with vitamin B_1 was not expected to exceed one-tenth of a penny per quartern white loaf. The Government had not undertaken the manufacture of this vitamin. It would for the present obtain supplies from a firm of chemical manufacturers. Proposals by two other firms had been considered. In a reply to Mr. Stokes on January 23 Mr. Johnstone said wholemeal bread made from 100% extraction flour contained per ounce about 28 units of vitamin B_1, but bread made from such a flour was not fully digested. Bread made from flour of 85% extraction, which was to be the minimum for a wholemeal flour, would contain about 20 units per ounce of vitamin B_1. It was proposed to add that vitamin to white flour in sufficient quantity to raise the content also to 20 units per ounce.

Mr. JOHNSTONE told Mr. Thorne on January 23 that a report by Dr. I. Harris of Liverpool upon the use of calcium in bread had been examined. To add calcium to bread was the Government's announced policy. The method and the amount to be added were under consideration.

Influenza Prevalence

Replying to Sir Francis Fremantle on January 23, Mr. MACDONALD said there was no evidence at present of any general epidemic of influenza. In the 126 major cities and towns of England and Wales during the four weeks ending January 13, 1940, there were respectively 27, 45, 94, and 158 deaths from influenza. The comparable figures for 1940–1 were 30, 40, 53, and 74. It was impossible to estimate with any precision the incidence of the disease in the coming months. Experience suggested that, unless a sudden marked increase in the number of deaths from influenza occurred in the near future, a serious epidemic would not supervene. All practicable steps had been taken to deal with the more serious possibilities.

Recall of Army Doctors for Civil Needs

On January 28 Sir FRANCIS FREMANTLE asked the Secretary of State for War if he would consider the seconding of medical officers from the Army, with arrangements for their instant recall in case of need, to relieve the excessive demands made on medical practitioners by the calling up of younger men and by the greatly increased demand for medical attention to the civil population during the winter months. Captain MARGESSON replied that applications for the temporary release from the Army of medical officers to meet the needs of the civil population had been, and would continue to be, sympathetically considered, but it must be remembered that the Army could ill spare their services.

Dyspepsia in the Army

On January 28 Sir FRANCIS FREMANTLE asked the Secretary of State for War what percentage of cases invalided from the British Expeditionary Force to this country were suffering from gastro-duodenal disease, and whether strict instructions would be given to recruiting boards to reject men with a history of organic dyspepsia, and save the loss and inefficiency caused thereby to the Army. Captain MARGESSON said that the percentage of patients suffering from gastro-duodenal disease among hospital cases invalided from the British Expeditionary Force was 11.76. In reply to the second part of the question, strict instructions on the point had already been given to recruiting medical boards.

Specialists as Medical Referees

On January 28 Mr. PEAKE informed Mr. Robert Gibson that ophthalmologists had been appointed as medical referees under the Workmen's Compensation Act for the Sheriffdoms of Lanark, Lothians and Peebles, and Renfrew. Medical referees to deal specially with cases of scheduled diseases (including dermatitis) had been appointed for the Sheriffdoms of Lanark and Renfrew. The Home Secretary appreciated that it might be desirable to strengthen the panels of medical referees in these and other areas by more extensive appointments of specialists, and he would be very glad to consider representations in regard to any particular area. Experience showed that it was extremely difficult to secure the services of suitable specialists as referees under present conditions.

Repatriation of Medical Prisoners of War

Mr. SAVORY on January 28 asked the Secretary of State for War what steps were being taken to facilitate the repatriation of medical officers serving in His Majesty's Forces, and now

captives in Germany. Captain MARGESSON said that the German Government had been informed that His Majesty's Government was ready to repatriate the German medical personnel who were entitled to repatriation under the Geneva Convention of 1929, if the German Government would also conform to the terms of the Convention as regarded British medical personnel in their hands. The matter was being actively pursued, but a satisfactory settlement had not yet been reached.

Tuberculous Persons in Shelters.—On January 22 Mr. MACDONALD stated that in addition to taking power to exclude a tuberculous person from a public shelter if his presence in the shelter was likely to be dangerous to other shelterers, he had made suggestions to local authorities for dealing with this problem. The responsibility for safeguarding the public health in any particular area rested in the first instance on the medical officer of health for the area. He had no doubt that officer would take steps to secure the provision of alternative shelter accommodation for any tuberculous persons for whom he thought such provision necessary in the public interest.

Notes in Brief

Mr. Lyttelton is reviewing the question of the restriction of 50% on the making of surgical belts and elastic hosiery for medical purposes.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

The last week of 1940 is remarkable in that, with the one exception of cerebrospinal fever, the incidence of the important notifiable diseases has declined compared with the preceding week. It is probable that delays in getting the returns from outlying areas, and perhaps a tendency to postpone notification for a few days until holidays are over, have been factors in the observed decreases, and the figures for next week may show a corresponding artificial change in the opposite direction.

Notifications of cerebrospinal fever were the highest for twenty-three consecutive weeks, being nearly four times those for the last week of 1939. Although the number is small compared with the peak figure of 623 in the week ended March 2, 1940, the early rise must give cause for some anxiety on account of present conditions. The disease is present in over two-thirds of the sixty-one administrative areas of the country, all of them potential foci for outbreaks of epidemic magnitude. The areas most heavily involved were: Lancaster 14 (Liverpool 7, Manchester 2, Bootle, Burnley, Blackpool, Leigh M.B., and Kirkham U.D., 1 each); London 12 (Kensington 4, Camberwell 2, Battersea, Bermondsey, Fulham, Hammersmith, Lewisham, Poplar, 1 each); Warwick 11 (Birmingham 7, Coventry 2, Sutton Coldfield M.B. 2); Chester 10 (Chester 3, Birkenhead 2, Altrincham M.B. 2, Congleton M.B. and Chester R.D. 1 each, Runcorn R.D. 1); Glamorgan 7 (Cardiff 3, Llwchwr U.D. 2, Port Talbot M.B. and Pontypridd U.D. 1 each); Durham 6 (Darlington and Sunderland 1 each, Felling U.D. 2, Billingham U.D. and Lanchester R.D. 1 each); and 5 each in the following administrative areas: Derby, Gloucester, Northumberland, Salop, Sussex W., Worcester, Yorks, West Riding, and Monmouth.

Measles is by far the more prevalent infectious disease at present, and it is probable that the incidence will continue to rise during February and March, but the abnormal conditions forbid even tentative prophecies. In the winter and spring of 1939–40, when measles was expected in epidemic force in accordance with its usual biennial periodicity, incidence was abnormally low, except in two densely populated administrative areas—Lancaster and the West Riding of Yorks. Whooping-cough, the next in order of prevalence, has also risen in recent weeks. The case-fatality of whooping-cough is nearly always higher than that of measles and much more invalidity follows in its train.

In August and September the fall in incidence of measles is attributable in part to climatic factors and in part to the effects of evacuation on the distribution and exposure of the non-immunes. With the advent of winter the increase has been progressive but not uniformly so. The steady low level of whooping-cough furnishes a striking contrast.

No. 52 for 1940

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended December 28, 1940.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included), (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1940 (a)	1940 (b)	1940 (c)	1940 (d)	1940 (e)	1939 (Corresponding Week) (a)	1939 (Corresponding Week) (b)	1939 (Corresponding Week) (c)	1939 (Corresponding Week) (d)	1939 (Corresponding Week) (e)
Cerebrospinal fever	171	13	35	1	4	45	5	16	—	1
Deaths		—	4				—	—		
Diphtheria	1,090	47	415	18	26	805	20	245	42	37
Deaths	30	—	7	2	—	24	—	9	2	3
Dysentery	112	4	22	—	—	37	2	27	—	—
Deaths			—	—	—			—	—	—
Encephalitis lethargica, acute	2	—	—	—	—	4	—	—	—	—
Deaths			—					3		
Enteric (typhoid and paratyphoid) fever	20	—	6	10	—	12	1	6	8	1
Deaths	—	—	—	1	—	—	—	1	—	—
Erysipelas		29	61	4	—			62	8	7
Deaths		1	—				1	—		
Infective enteritis or diarrhoea under 2 years	39	2	5	6	1	22	3	12	4	4
Deaths										
Measles	13,188	366	158*		16	2,157	9	16		125
Deaths	23	4	3	—	—	7	—	—	1	—
Ophthalmia neonatorum	44	2	17	1	—	50	4	15	—	—
Deaths										
Pneumonia, influenzal†	857	41	11	5	1	649	27	15	3	6
Deaths (from influenza)	40	2	7	3	1	46	8	3	1	—
Pneumonia, primary			223	1				271	13	
Deaths‡		49		8	13		13		13	9
Polio-encephalitis, acute	2	—				—	—			
Deaths		—					—			
Poliomyelitis, acute	8	—	2	—	—	4	—	—	—	—
Deaths		—	—				—	—		
Puerperal fever	1	1	13	3	—	2	2	10	—	—
Deaths		—					1§			
Puerperal pyrexia	71	—	14		—	129	6	9		2
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,193	65	215	41	24	1,042	22	169	50	74
Deaths	3	—	—	1	—	3	—	—	—	—
Small-pox	—	—	—	—	—	—	—	—	—	—
Deaths		—	—	—	—		—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough	1,846	20	136*		16	602	9	11		6
Deaths	16	1	7	—	1	3	1	—	1	1
Deaths (0-1 year)	386	24	64	28	14	322	38	99	22	18
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	6,150	823	682	155	145	5,960	1,080	715	212	152
Annual death rate (per 1,000 persons living)			13.8	10.3	12.7			14.5	14.3	13.4
Live births	2,863	168	786	152	137	3,788	507	831	260	167
Annual rate per 1,000 persons living			15.9	10.1	12.0			16.8	17.5	14.7
Stillbirths	161	8	44			211	22	27		
Rate per 1,000 total births (including stillborn)			53					31		

* Notification in certain administrative areas only.

† Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

‡ Since January 1, 1940, figures for London (b) have been for deaths from all forms of pneumonia; the corresponding figures for 1939 relate to deaths from lobar pneumonia only.

§ Death from puerperal sepsis.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.
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QUERIES AND ANSWERS

Diphtheria Incidence: A Small-pox Analogy

Dr. C. KILLICK MILLARD (Leicester) writes: Dr. Robert Anderson's reply (January 25, p. 144) to Dr. R. M. Courtauld is intended to demonstrate, presumably, the value of diphtheria immunization by comparing it with vaccination against small-pox. In both cases it has been established that those individuals who have been protected (vaccinated or immunized) show a far smaller incidence of small-pox or diphtheria than those who have not been protected. This has often been regarded as conclusive evidence of the value of vaccination or immunization in protecting the community. Indeed, the case for vaccination in the past was largely based upon it. Unfortunately there is a possible fallacy in this argument, for it is not safe to argue from the individual to the community. Personally I believe that the case for vaccination in protecting a community has been greatly overrated on account of this fallacy, and to-day most authorities will agree, I think, that small-pox has vanished from this country for quite other reasons than vaccination. In India, on the other hand, vaccination (although it protects the individual, as in this country) has signally failed to protect the community, and the death rate from small-pox in India continues to be appalling, although the amount of vaccination and revaccination done there is, in proportion to population, far greater than in this country. In the case of immunization against diphtheria, although it has been proved that it protects the individual, we are still awaiting conclusive evidence (from this country) that it will protect the community. How many (if any) towns or districts can we point to where there is evidence, as yet, that diphtheria mortality has been reduced as the result of immunization? I am certainly not opposed to immunization, and very much of my time at present is being devoted to the immunizing of children against diphtheria.

Dysmenorrhoea

Mr. A. J. HOBSON, F.R.C.S. (Wimbledon), writes: I should like to recommend the following prescription to "Country Practitioner" (December 28, p. 924) for use in dysmenorrhoea:

℞	Ac. lact.	gr. cc
	Cret. praecip...	gr. lxxv
	Chlorof.	♏viij
	Aq. .. .. ad	ʒviij

F.m. Sig.: ʒj, t.d.s., p.c.

The mixture should not be made any stronger than this, and no more than four days' supply prepared at once, otherwise it becomes thick and valueless. I find that it cures or substantially relieves three out of four cases of dysmenorrhoea without organic cause. It is also an excellent curative and even better prophylactic for chilblains. It is, in fact, the only medium I have yet encountered by which calcium can be introduced to the human economy in a satisfactory way by the oral route.

Prevention of Herpes Labialis

"H. A." writes: I should be grateful for suggestions for the prevention of recurrent attacks of herpes labialis. The patient, a lady, never suffered from the attacks till four years ago, but now has attacks frequently; she attributes it to infection from another sufferer.

Treatment of Snoring

Dr. GEORGE MACDONALD (London, W.1) writes: I have been consulted recently by patients who snore. In view of so much communal sleeping this complaint has become of pressing importance. I wonder if there is any way in which I could find out the latest information about it with regard to a line of treatment. It struck me that possibly some ideas might have developed as a result of the present situation.

Income Tax

Cessation of Practice—Commencement of Appointment

"J. C." ceased general practice three years ago and afterwards accepted a public appointment. How should his earned income be calculated?

*** *Cessation.*—The income for the financial year in which the general work ceased should be calculated at the amount of the earnings for the period from the previous April 6 to the date of cessation; as regards the previous financial year the Revenue has the right of raising the assessment to the amount of the earnings for that (actual) year. If this was not done at the proper time the Revenue can now correct the omission by making additional assessments, but it is not seen why they should claim to do so "in respect of the last three years."

Commencement.—The rule is, as regards (*a*) the part of the first year to April 5—the actual basis; (*b*) the first complete financial year—the actual basis; and (*c*) the next year—the previous year's earnings—that is, the same amount as for (*b*). It should, however, be borne in mind that if the earnings for the third year—that is, (*c*) above—are less than the amount assessed, the taxpayer can claim, within twelve months, to have the assessment reduced to the actual basis. The standard rates of tax in recent years have been: 1939–40, 7s. in the £; 1940–1, 8s. 6d. in the £. The expense of "J. C.'s" postgraduate course is not regarded as allowable.

War Service—Civil Emoluments

"BELFAST" is in the Army, and his employers are making him an *ex gratia* payment to supplement his Army pay. Are these amounts liable to tax?

*** Yes. They are received in respect of his past civilian services, and cannot be successfully argued to be "gifts."

LETTERS, NOTES, ETC.

Definition of Surgical Shock

Mr. A. P. BERTWISTLE, F.R.C.S.Ed., writes: The need for clarification of the meaning of the word "shock" is obvious to all who teach first-aiders. The term "shock" has many meanings to the layman. I suggest that the adjective "surgical" would help to clear his mind of the other shocks he knows of. The actual nature of the underlying factors is still in dispute, but the theory which regards it as dilatation of the capillaries of the voluntary muscles fits in best with the findings and treatment. The following definition appears to be as good as any: *Surgical shock is a condition of depression or helplessness due to loss of circulating blood brought about by actual haemorrhage, pain, anxiety, or cold, or by all four factors acting together.* The best example of surgical shock is the patient who has just had a severe operation and has recovered from the anaesthetic. At least one member of the class will have seen such and can describe it to the rest in words intelligible to the layman. This definition suggests the treatment. Bleeding is arrested as soon as possible; fluids, and above all transfusion, make up this loss. Pain is relieved by gentle splints for fractures, and morphine at the post. Anxiety is relieved by efficient work by the team. Cold is countered by blankets and hot-water bottles.

Ether Convulsions

Dr. W. F. COOPER (Raynes Park, S.W.20) writes: The following point may be of interest and might possibly produce some solution of the difficulty. In working out the best saline for tissues much work has been done on most of the ions. But one which is always present in tissues, blood, etc., has had very little work done on it, is seldom considered in salines, and never used. That is the magnesium ion. This is a very peculiar ion, and so it is the more odd that so little has been done on it. Bayliss in *General Principles of Physiology* (1918) gives an account of it. On page 217 he refers to the work in which Meltzer showed that only about one-tenth of the amount of ether normally used was necessary if magnesium sulphate solution were injected intramuscularly. Some of us will have used it, probably to augment the effect of morphine in obstetrics—and it certainly seems to be good. So that it seems that the magnesium ion has some sedative effect, and this suggests that the convulsions may be due to lack of it in the blood of those particular patients; that the cure and also prophylactic measure would be to inject it. In fact, it seems extremely odd that this work has not been followed up as a possible routine method of anaesthesia. Some patients do seem to be lacking in magnesium in so far that it is often very beneficial. I believe that it is always good to give in any skin affection, and by injection sometimes; and this applies to eczema more than anything.